EXHIBIT K

URS

FINAL LEACH TESTING REPORT
FORMER KIRSCH PLANT NO. 1 SOURCE AREA
STURGIS MUNICIPAL WELL FIELD
SUPERFUND SITE, STURGIS, MICHIGAN

NOVEMBER 9, 2015
25366459.00511

Submitted By:
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Final Leach Testing Report, Former Kirsch Plant No. 1 Source Area
Sturgis Municipal Well Field Superfund Site, Sturgis, Michigan

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Sturgis Municipal Well Field Superfund Site, Sturgis, Michigan

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1.0 INTRODUCTION

URS Corporation (URS) prepared this Final Leach Testing Report on behalf of Newell Rubbermaid Inc. (Newell). This report presents the results of the leach testing investigation performed at the former Kirsch Plant No. 1 source area (Kirsch source area) in Sturgis Municipal Well Field Superfund Site located in the City of Sturgis, St. Joseph County, Michigan. This final report was prepared in accordance with the following documents and communications:

- Revised Work Plan for Soil Leach Testing in the Former Kirsch Plant No. 1 Source Area, dated April 29, 2013 (URS, 2013)
- Michigan Department of Environmental Quality (MDEQ) Approval Letter of Revised Work Plan for Soil Leach Testing, dated May 8, 2013 (MDEQ, 2013)
- Leach Testing Report, dated January 24, 2014 (URS, 2014a)
- MDEQ Comments - Sturgis Wellfield Leach Testing Report, dated May 7, 2014 (MDEQ, 2014a)
- URS Response to MDEQ Comments on the Leach Testing Report, dated June 9, 2014 (URS, 2014b)
- Summary of June 20, 2014 Meeting with MDEQ, dated July 8, 2014 (URS, 2014c)
- MDEQ Response to Sturgis Meeting Summary, dated August 4, 2014 (MDEQ, 2014b)
- Revised Leach Testing Report, Former Kirsch Plant No.1 Source Area, dated September 9, 2014 (URS, 2014d)
- Comments provided by Sigma Statistical Consulting (SSC) on the Revised Leach Testing Report dated April 14, 2015 (SSC, 2015a)
- URS Response to SSC comments on the Revised Leach Testing Report, dated June 4, 2015 (URS, 2015)
- Email communication from Sarah Hession of SSC, dated September 24, 2015 (SSC, 2015b)

The Kirsch source area is located in the central portion of the City of Sturgis in St. Joseph County, Michigan, approximately two miles north of the Indiana state line (**Figure 1-1**). The Kirsch source area consists of two parcels, the east and west parcels, separated by North Prospect Street (**Figure 1-2**). The east parcel consists of an office building and a material storage shed (pole building) occupied by Industrial Piping and Maintenance, Inc. (IPM). Outside the building footprint, the majority of the east parcel is covered in grass. The west parcel is currently developed, and consists of two buildings purported to be undergoing or awaiting renovation for conversion into retail and condominium buildings. An air stripping tower and a blower building, which were previously part of the groundwater treatment system for the Superfund Site as a whole and associated with extraction well EW-1, were recently demolished by the property owner in June 2014. Outside the footprint of the

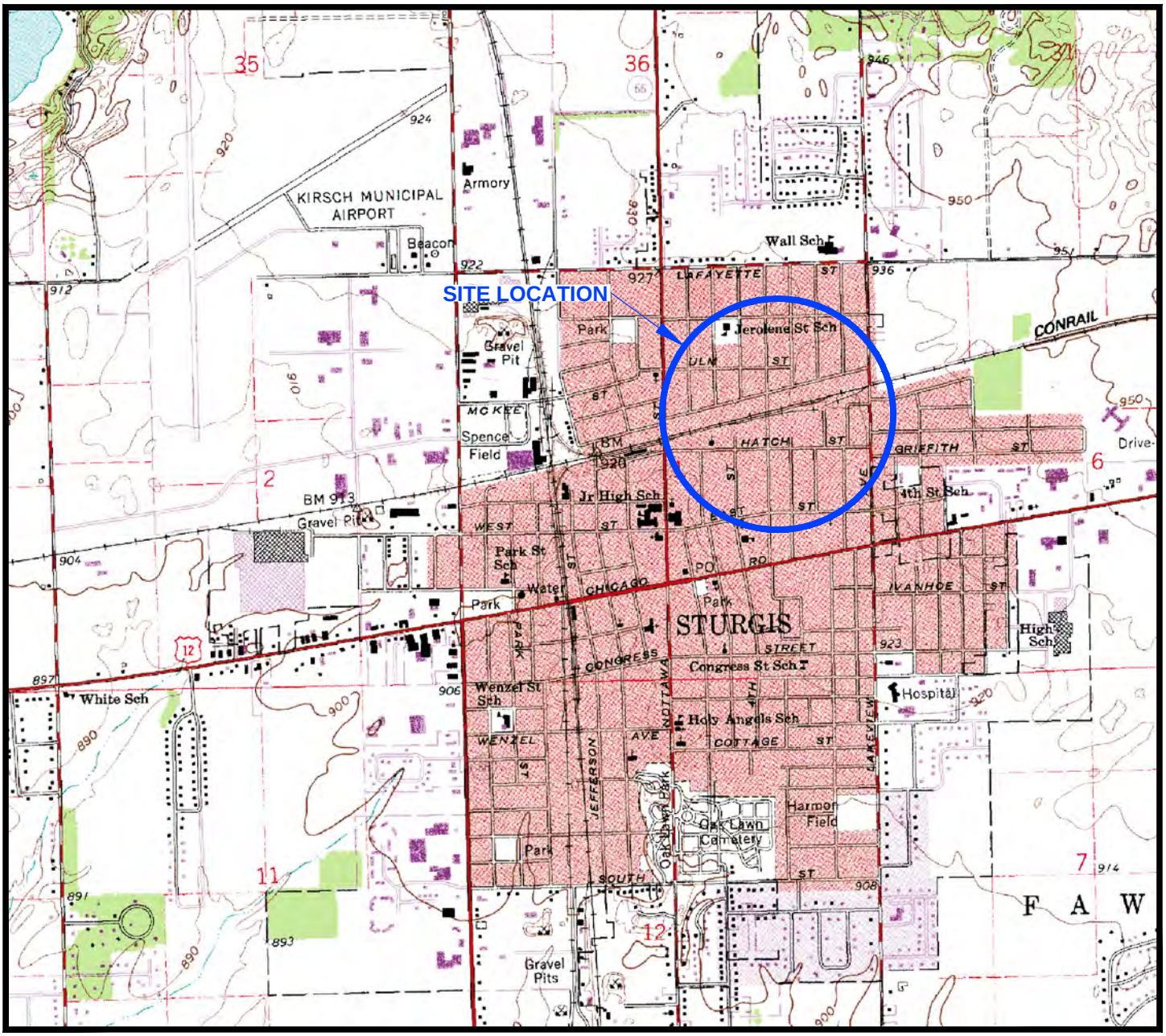
buildings and the former treatment system, the majority of the west parcel is covered with either asphalt or concrete.

The soil leach testing in the Kirsch source area was conducted between November 4 and 13, 2013. The objective of this investigation was to determine whether trichloroethene (TCE) and tetrachloroethene (PCE) can remain in the fill material and sandy soil at concentrations greater than the generic soil cleanup criteria of 100 ug/Kg (for both constituents) without leaching to the groundwater at concentrations greater than the groundwater cleanup criteria of 5 ug/L (for both constituents).

To accomplish the above project objective, the following investigation activities were conducted in the Kirsch source area:

- Advanced 34 soil borings in the vadose zone. Five borings were advanced in the west parcel and 29 soil borings were advanced in the east parcel.
- Collected the following samples from the fill material:
  - 31 soil samples and five duplicate samples for TCE and PCE analysis
  - 31 soil samples and five duplicate samples for synthetic precipitation leaching procedure (SPLP) TCE and PCE analysis
  - Seven soil samples for particle size and particle distribution analysis
- Collected the following samples from sandy soil:
  - 46 soil samples and seven duplicate samples for TCE and PCE analysis
  - 46 soil samples and seven duplicate samples from the sandy soil for SPLP TCE and PCE analysis
  - 10 soil samples for particle size and particle distribution analysis

The investigation field activities and results are presented in the following sections of this report.



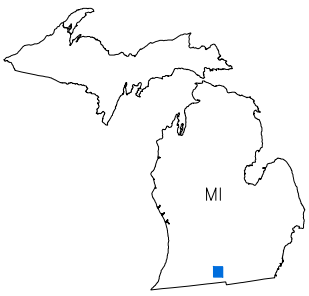
SCALE: 1:24 000

1 0 1/2 0 1 MILE

1000 0 1000 2000 3000 4000 5000 6000 7000 FEET

1 .5 0 1 KILOMETER

NORTH



QUADRANGLE LOCATION

MAP REFERENCE:

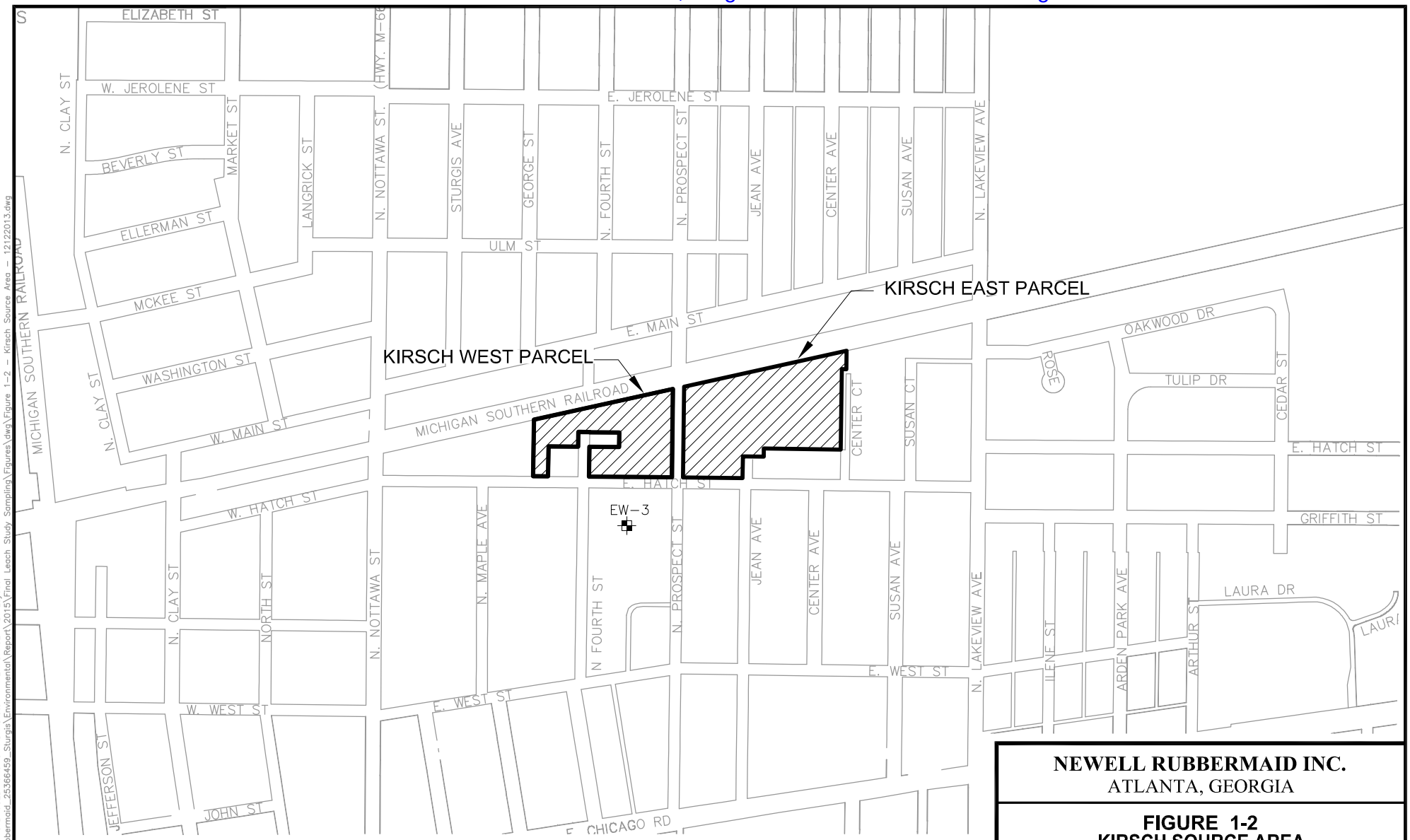
PORTION OF U.S.G.S. QUADRANGLE MAP
7 ½ MINUTE SERIES (TOPOGRAPHIC)
STURGIS, MICHIGAN 1961 PHOTOREVISED 1982

NEWELL RUBBERMAID INC.
ATLANTA, GEORGIA

FIGURE 1-1
SITE LOCATION MAP
STURGIS MUNICIPAL WELL FIELD
SUPERFUND SITE STURGIS, MICHIGAN

DATE:	January 13, 2014
JOB NO.:	25366459.00511
DRAWN BY:	LLM
CHK'D BY:	RR
SCALE:	AS SHOWN

URS
100 SOUTH WACKER DRIVE, SUITE 500
CHICAGO, ILLINOIS 60606
PHONE: (312) 939-1000
FAX: (312) 939-4198



LEGEND

- EXTRACTION WELL LOCATION
- PROPERTY BOUNDARY
- KIRSCH PLANT NO.1 SOURCE AREA

NORTH

0 300 600 1200

SCALE IN FEET

REFERENCE: MOSTROM & ASSOC., INC., SURVEY NO. ST1-22960, 6/27/2012

NEWELL RUBBERMAID INC.
ATLANTA, GEORGIA

FIGURE 1-2
KIRSCH SOURCE AREA
AND SURROUNDING AREAS
STURGIS MUNICIPAL WELL FIELD
SUPERFUND SITE STURGIS, MICHIGAN

DATE: November 3, 2015	
JOB NO.: 25366459.00511	
DRAWN BY: LLM	CHK'D BY: RR
SCALE: AS SHOWN	

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2.0 FIELD INVESTIGATION

Field investigation activities were conducted at the Kirsch source area between November 4 and 13, 2013. The investigation was conducted in accordance with the approved work plan for soil leach testing (URS, 2013). The following sections describe the field investigation activities.

2.1 Pre-Investigation

Prior to the beginning of drilling activities, the locations of the proposed soil borings were marked and subsurface utilities were located. URS coordinated these tasks with the City of Sturgis and property owners to minimize interference with normal activities. A roll-off box staging area was also established on the east parcel. An operation base for decontamination and equipment storage was set up in the middle of the west parcel.

2.2 Soil Investigation

All soil borings were completed using a track-mounted CME 55LC (low-clearance) hollow stem auger (HSA) drill rig. The drill rig utilized standard 3¼-inch inside diameter (ID) HSAs. All soil samples were collected using a 2-foot long, 2-inch outer diameter (OD) split-spoon sampler driven with a standard automatic hammer on the drill rig. All soil borings advanced during this investigation, were blind drilled to the desired sample depth and lithology was only logged for depth intervals where samples were collected. Immediately after opening each split spoon sampler, the soil was field screened for volatile organic compounds (VOCs) using a portable photoionization detector (PID) equipped with an 11.7 eV lamp. A picture of each sample interval was taken and is provided in a photo log in **Appendix A**.

Within each predetermined sample interval, the following soil samples were collected:

- A 10 gram soil sample for TCE and PCE analysis
- Soil sample in a 4-ounce jar for percent moisture content (dry weight correction)
- A 25 gram soil sample for SPLP TCE and PCE analysis
- At 20% of the sampled intervals within the fill material and sandy soil, a fourth sample was collected to determine the particle size and particle distribution

During the field investigation, no unique soil type was encountered. As such, duplicate samples were not collected for particle size and particle distribution. The soil samples were collected as follows:

- The soil samples for TCE and PCE analysis were collected in accordance with United States Environmental Protection Agency (USEPA) Method 5035. An ESS Lock N' Load disposable soil core sampler was used to collect approximately 10 grams of undisturbed soil and placed in 40-mL vials preserved with 10-mL methanol.
- The soil samples to determine the percent moisture content (dry weight correction) were collected by placing soil into a 4-ounce jar.

- The soil samples for SPLP analysis were collected using a 25 gram En Core soil sampler. The sample was collected in accordance with MDEQ Remediation and Redevelopment Division (RRD) Operational Memorandum No. 2 (MDEQ, 2004a). The sample weight was field determined by subtracting the sampling device weight from the weight of the device with the soil sample to ensure 25 grams (+/-3grams) was collected. The sealed sample was immediately placed in an onsite freezer maintained at a temperature that ranged from -17 ^{0}C to -14 ^{0}C (below zero degrees Celsius). During transportation to the laboratory, the SPLP samples were stored in a 12V DC portable freezer that was maintained at a temperature that ranged from -20 ^{0}C to -14 ^{0}C. At the laboratory, the soil samples were either directly extruded into the leaching solution or stored temporarily in an onsite freezer below zero degrees Celsius prior to analysis. All SPLP samples collected for the project were maintained below zero degrees Celsius and extruded into the leaching solution within 48 hours of collection.
- The soil samples for particle size and particle distribution were collected in an 8-ounce jar.

The collected samples, with the exception of the SPLP samples, were placed on ice immediately after collection. All samples were picked up daily by TestAmerica and transported to their laboratory in University Park, Illinois for analysis.

All sample analysis was performed by TestAmerica, a National Environmental Laboratory Accreditation Conference (NELAC) accredited laboratory. The TCE and PCE analysis was performed using USEPA Method 8260B. The SPLP analysis was performed using USEPA Method 1312 with reagent grade water. The particle size and particle distribution analysis was completed using the American Society for Testing and Materials (ASTM) Method D422.

2.2.1 Fill

A total of 31 soil sample intervals were targeted within the fill material at 29 soil boring locations. Thirty-one soil samples and five duplicates were collected for TCE and PCE analysis, and 31 soil samples and five duplicates were collected for SPLP TCE and PCE analysis. Seven samples were also collected from within the 31 soil sample intervals for particle size and particle distribution analysis. The number of soil borings and soil samples collected in the fill material are summarized in **Table 2-1**. The soil boring locations where samples were collected in the fill material are shown in **Figure 2-1**.

2.2.2 Sand

A total of 46 soil sample intervals were targeted within the sandy soil at nine soil boring locations. Forty six soil samples and seven duplicates were collected for TCE and PCE analysis, and 46 soil samples and seven duplicates were collected for SPLP TCE and PCE analysis. Ten samples were also collected from within the 46 soil sample intervals for particle size and particle distribution analysis. The number soil borings and soil samples collected in the sandy soil are summarized in **Table 2-1**. The soil boring locations where samples were collected in the sandy soil are shown in **Figure 2-1**.

2.3 Decontamination

A large metal bin with a plastic liner was set up in the west parcel to collect the water arising from decontamination activities. The HSA flights and any other down hole equipment were placed inside the decontamination bin and sprayed with a high pressure wash before each boring was advanced. Small sampling equipment (i.e. split-spoon and other tools) were decontaminated between each sample interval using a Liquinox wash and potable water rinse. All rinse water was transferred into the large metal bin for disposal.

2.4 Waste Management

Soil cuttings from soil sampling activities were contained in one 20-cubic yard roll-off bin placed on the east parcel of the site. The roll off was labeled to indicate the contents and date(s) of generation. The soil cuttings were analyzed by TestAmerica and characterized as non-hazardous waste. The soil waste was transported by Terra Contracting of Kalamazoo, Michigan to Waste Management's Westside Regional Disposal Facility (RDF) in Three Rivers, Michigan for disposal. Waste water generated from decontamination activities was transferred to smaller containers and disposed of at the onsite groundwater treatment facility. A copy of the waste manifest is located in **Appendix B**.

2.5 Surveying

The locations of the soil borings were surveyed by Mostrom and Associates, Inc. of Centreville, Michigan. The northing and easting of the soil borings were located using global position system (GPS). The ground surface elevation at each soil boring was surveyed using optical method to an accuracy of 0.01 feet. The horizontal coordinates were referenced to the Michigan State Plane Coordinate System - South Zone, NAD83 (1983). All elevation data were referenced to the National Geodetic Vertical Datum (NGVD) of 1929.

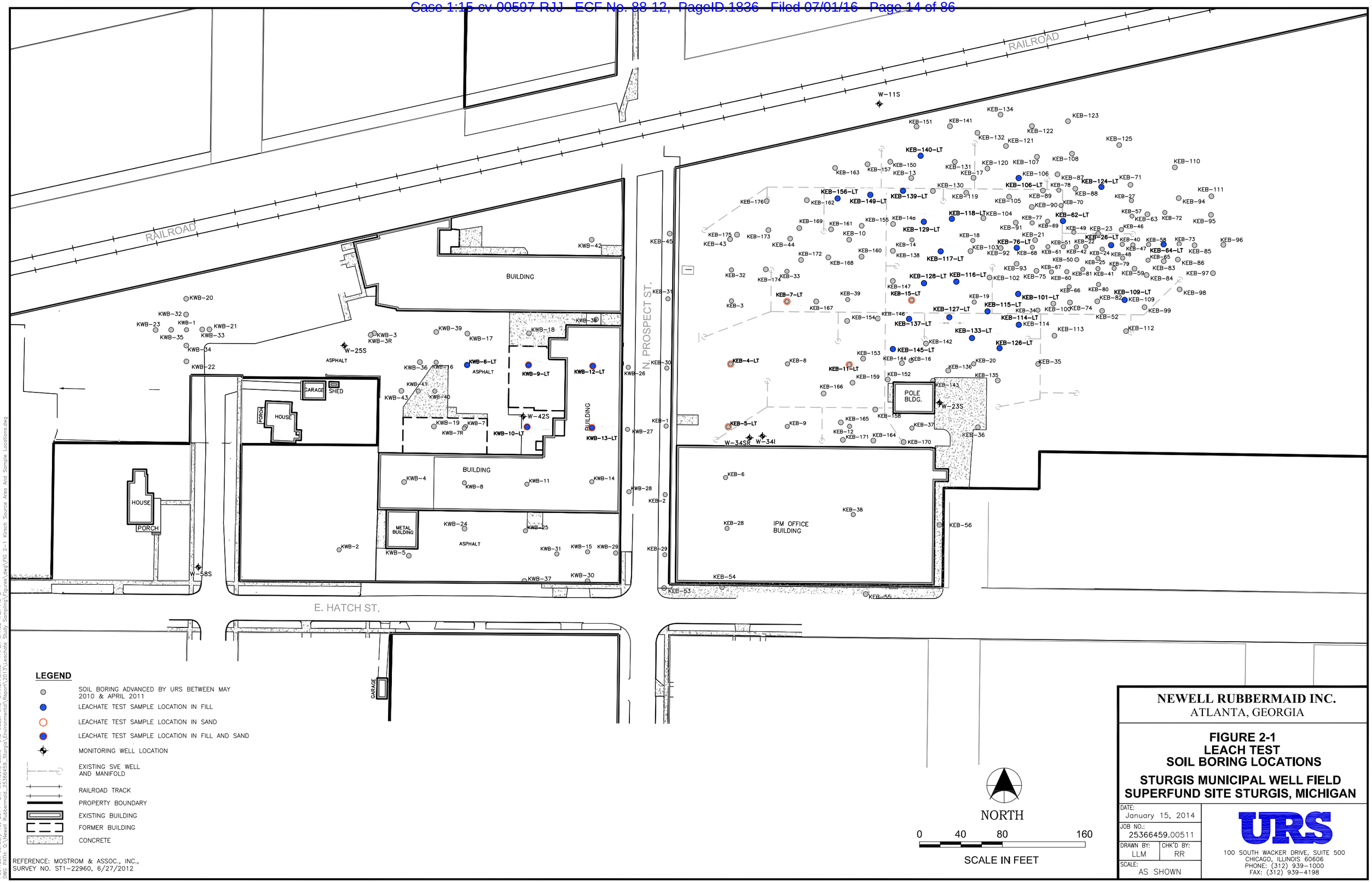
Table 2-1 Soil Boring and Sample Summary

Target material	Number of Soil Borings	Number of Samples				
		TCE/PCE	Duplicates	SPLP TCE/PCE	Duplicates	Particle Size and Distribution[(b)]
Fill	29	31	5	31	5	7
Sand	9[(a)]	46	7	46	7	10
Total	**34**	**77**	**12**	**77**	**12**	**17**

Notes:

[(a)] Four of the nine soil borings were also used to collect soil samples from the fill material.

[(b)] Duplicate samples were collected only for total TCE and PCE and SPLP TCE and PCE analysis. Duplicate samples for particle size and distribution were not collected during this investigation.



LEGEND

- SOIL BORING ADVANCED BY URS BETWEEN MAY 2010 & APRIL 2011
- LEACHATE TEST SAMPLE LOCATION IN FILL
- LEACHATE TEST SAMPLE LOCATION IN SAND
- LEACHATE TEST SAMPLE LOCATION IN FILL AND SAND
- MONITORING WELL LOCATION
- EXISTING SVE WELL AND MANIFOLD
- RAILROAD TRACK
- PROPERTY BOUNDARY
- EXISTING BUILDING
- FORMER BUILDING
- CONCRETE

REFERENCE: MOSTROM & ASSOC., INC., SURVEY NO. ST1-22960, 6/27/2012

NORTH

0 40 80 160

SCALE IN FEET

NEWELL RUBBERMAID INC.
ATLANTA, GEORGIA

FIGURE 2-1
LEACH TEST
SOIL BORING LOCATIONS

STURGIS MUNICIPAL WELL FIELD
SUPERFUND SITE STURGIS, MICHIGAN

DATE: January 15, 2014	
JOB NO.: 25366459.00511	
DRAWN BY: LLM	CHK'D BY: RR
SCALE: AS SHOWN	

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3.0 INVESTIGATION RESULTS

This section describes the physical characteristics of the soil at the Kirsch source area, and discusses the soil analytical results.

3.1 Soil Physical Results

Soil samples collected from the fill material and sandy soil were submitted to the laboratory for particle size and particle distribution analysis to determine the predominant composition of each soil type. The results of the analysis are presented in **Table 3-1** and the laboratory reports are provided in **Appendix C**.

3.1.1 Fill

A total of seven soil samples were collected from seven soil borings within the fill material. The locations of these soil borings are shown in **Figure 3-1** and the results of the particle size analysis are presented in **Table 3-1**. The results indicate that the fill material consists of gravel ranging from 1.7% to 25.1%, sand between 51.1% and 63.2%, silt between 5.2% and 24.3%, and clay between 6.8% and 22.9%. On an average, the fill material consists of approximately 14% gravel, 57% sand, 16% silt, and 13% clay. In general, the fill material consists primarily of sand and minor amounts of silt, gravel, and clay.

3.1.2 Sand

A total of 10 soil samples were collected from eight soil borings within the sandy soil. The locations of these soil borings are shown in **Figure 3-1** and the results of the particle size analysis are presented in **Table 3-1**. The results indicate that the sandy soil consists of gravel ranging from 1.9% to 52%, sand between 41.8% and 93.2%, silt between 2.2% and 7.8%, and clay between 0.8% and 8.4%. On an average, the sandy soil consists of approximately 16% gravel, 77% sand, 5% silt, and 2% clay. In general, the sandy soil consists primarily of sand and minor amounts of gravel and traces of silt and clay.

3.2 Soil Analytical Results

A total of 77 soil sample intervals were targeted at 34 soil boring locations for the collection of soil samples. Of the 77 intervals, 31 sample intervals were in fill material and 46 sample intervals were in sandy soil. The analytical results for TCE and PCE in soil and TCE and PCE in the leachate (SPLP TCE and PCE) for the fill material and sandy soil are summarized in **Table 3-2** and **Table 3-3**, respectively. The laboratory analytical reports are provided in **Appendix C**.

3.2.1 Fill

A total of 31 soil samples and five duplicate samples were collected from within the fill material. These soil samples were collected from a total of 29 soil boring locations. The analytical results for TCE and PCE in soil and in the leachate for the fill material are summarized in **Table 3-2**. The soil analytical results are also presented in **Figure 3-2**.

The soil TCE concentration in the fill ranged from non-detect (<31 ug/Kg) to 24,000 ug/Kg. The highest detected TCE concentration of 24,000 ug/Kg was observed in sample

KEB-117 (0-2)-LT. The leachate TCE concentration in the fill ranged from non-detect (<0.5 ug/L) to 120 ug/L. The highest leachate TCE concentration of 120 ug/L was observed at the sample interval with the highest soil TCE concentration (KEB-117 (0-2)-LT).

The soil PCE concentration in the fill ranged from non-detect (<52 ug/Kg) to 1,300 ug/Kg. The highest detected PCE concentration of 1,300 ug/Kg was also observed in sample KEB-117 (0-2)-LT. The leachate PCE concentration in the fill ranged from non-detect (<0.55 ug/L) to 10 ug/L. The highest leachate PCE concentration of 10 ug/L was observed in sample KWB-10 (1.9-2.5)-LT, which had a soil PCE concentration of 990 ug/Kg.

3.2.2 Sand

A total of 46 soil samples and seven duplicate samples were collected from within the sandy soil. These soil samples were collected from a total of nine soil boring locations. The analytical results for TCE and PCE in soil and in the leachate for the sandy soil are summarized in **Table 3-3**. The soil analytical results are also presented in **Figure 3-3**.

The soil TCE concentration in the sand ranged from 16 to 7,000 ug/Kg. The highest detected TCE concentration of 7,000 ug/Kg was observed in sample KWB-12 (30-32)-LT. The leachate TCE concentration in the sand ranged from non-detect (<0.5 ug/L) to 38 ug/L. The highest leachate TCE concentration of 38 ug/L was observed in sample KWB-10 (14-16)-LT which had a soil TCE concentration of 1,500 ug/Kg.

The soil PCE concentration in the sand ranged from 27 to 540 ug/Kg. The highest detected PCE concentration of 540 ug/Kg was observed in sample KWB-10 (14-16)-LT. The leachate PCE concentration in the sand ranged from 0.69 to 8.2 ug/L. The highest leachate PCE concentration of 8.2 ug/L was observed in sample KEB-15(38-40)-LT duplicate, which had a soil PCE concentration of 180 ug/Kg.

3.3 Quality Control/Quality Assurance Summary

Data validation was performed to assess the quality and accuracy of the analytical results generated for the soil, leachate, and waste samples. Data validation specifically includes an assessment of sample handling protocols, laboratory quality control (QC) performance, and field QC. When QC results indicate unacceptable performance, data qualifiers are applied to the results to inform the data user of the possible performance issue. These qualifiers are either in addition to the qualifiers provided by the laboratory or a revision of the laboratory qualifiers. Results where QC criteria are not met are qualified as estimated ("J" for positive results and “UJ” for non-detect results). A data validation report (DVR) was completed for the reviews and contained a detailed narrative of the findings of the validation. The DVRs are provided in **Appendix D**. The following paragraphs provide a summary of the validation findings.

The laboratory reported the results of the soil and leachate samples in multiple sample delivery groups (SDGs). Seventy-seven soil samples, one waste composite sample, 12 field duplicates, nine trip blanks, nine equipment blanks, and nine field blanks were submitted to the laboratory. The SDG identifications were 500-66170, 500-66257, 500-66378, 500-66467, 500-66513, 500-66663, 500-66737, and 500-66740. Each SDG was further divided into two laboratory lots (identified as -1 and -2) with the first lot providing chemical analytical results and the second lot providing the geotechnical results.

Chemical analysis included VOCs for the "total" measure of TCE and PCE using USEPA SW846 Method 5030B/8260B (analysis using Gas Chromatography/Mass Spectrometry [GC/MS]) (USEPA, 2008), and for the "leachate" measure of TCE and PCE using USEPA SW846 Method 1312 (SPLP) followed again by Method 5030B/8260B (USEPA, 2008). As required, the laboratory used appropriate calibration procedures and QC samples to confirm the accuracy and precision of the results. Geotechnical analysis included particle size analysis of soils using ASTM Method D422 (ASTM, 2007).

A few sample handling issues were observed including the following: 1) for SDGs 500-66170 and 500-66257, samples KWB-12 (0-2)-LT, KWB-12 (30-32)-LT, and DUP-3-11052013 were received with inverted septa; there was no evidence of sample leaking from the vials but as a conservative approach, the associated results were flagged as estimated (J flag); 2) for SDG 500-66257, soil vials for samples DUP-4-11052013, KWB-6 (0-2)-LT, DUP-11-11122013, KEB-140 (0-2)-LT, and KEB-149(0-2)-LT were received with less than 8 grams of soil in 10 milliliters of methanol, no qualification was made for this issue as the laboratory accurately reported the results based on the gram weight received; 3) for SDGs 500-66663 and 500-66737, the laboratory received soil trip blanks which were listed as water samples on the chain-of-custody (COC), the laboratory logged the trip blank samples accordingly; and 4) for SDG 500-66663, the sample labels on the containers and the COC did not match for sample KEB-15 (38-40), the laboratory listed the samples as shown on the COC.

The laboratory's QC sample results also were acceptable in all cases. The laboratory analyzed method blanks, laboratory control samples (LCS), matrix spike/matrix spike duplicates (MS/MSD), and used surrogate compounds to evaluate purge efficiency. The laboratory method blanks did not contain any VOCs indicating a contaminant-free laboratory setting. All percent recoveries and relative percent differences (RPDs) were within laboratory control limits indicating acceptable accuracy and precision for the method for the LCS analyses. Similarly, the MS/MSD analysis, conducted using project samples KWB-12 (0-2)-LT, KWB-13 (2.5-3)-LT, KWB-13 (18-20)-LT, KWB-9 (32-34)-LT, KEB-4 (36-38)-LT, KWB-10 (14-16)-LT, KEB-5 (48-50)-LT, KEB-11(8-10)-LT, KEB-149 (0-2)-LT, and KEB-26 (0-2)-LT showed acceptable percent recoveries and RPDs in all cases. No qualification of results was required.

This project scope also required the submittal of field QC samples, including trip blanks, field blanks, equipment blanks, and field duplicates. There was no contamination in the trip blank, field blank, or equipment blank samples indicating no cross-contamination of samples during shipment and/or during decontamination processes. The field duplicate samples were collected to assess field sampling and laboratory precision. The duplicate results showed good comparability and acceptable precision (i.e., positive results had RPDs less than 30% (leachate samples) or 50% (soil samples), or results were non-detect in both parent and field duplicate samples). These field duplicates included DUP-1 (KWB-12 (0-2)-LT), DUP-2 (KWB-13 (20-22)-LT), DUP-3 (KWB-13 (38-40)-LT), DUP-4 (KWB-6 (0-2)-LT), DUP-5 (KEB-4 (28-30)-LT), DUP-6 (KEB-5 (48-50)-LT), DUP-7 (KEB-11 (8-10)-LT), DUP-8 (KEB-15 (28-30)-LT), DUP-9 (KEB-15 (38-40)-LT), DUP-10 (KEB-128 (0-2)-LT), DUP-11 (KEB-140 (0-2)-LT), and DUP-12 (KEB-76 (0-2)-LT). In only a small number of cases (DUP-1, DUP-3, DUP-9, and DUP-10) were associated results required to be qualified

as estimated (J flag) due to imprecision. These results are considered usable without restriction.

Only one sample was diluted prior to analysis to bring the concentrations of the target compounds within the calibration range. This sample was KEB-117 (0-2)-LT (x200 dilution). This is an acceptable practice to obtain accurate results; therefore, no qualification was required. As previously stated, some laboratory results were qualified as estimated (J flag) but are still considered usable for quantitative purposes and which still meet the data quality objectives of this project. No analytical results were rejected.

Table 3-1 Soil Grain Size Analysis Results

Fill

Sample Location	KEB-76	KEB-116	KEB-128	KEB-140	KWB-6	KWB-10	KWB-13
Sample Name	KEB-76 (0-2)-LT	KEB-116 (0-2)-LT	KEB-128 (0-2)-LT	KEB-140 (0-2)-LT	KWB-6 (0-2)-LT	KWB-10 (0-2)-LT	KWB-13 (4-6)-LT
Sample Date	11/12/2013	11/12/2013	11/12/2013	11/12/2013	11/5/2013	11/6/2013	11/5/2013
Sample Interval (ft)	(0-2)	(0-2)	(0-2	(0-2)	(0-2)	(0-2)	(4-6)
Analyte %							
Gravel	15.3	3.9	8.4	1.7	22.8	25.1	19.4
Sand	58	63.2	51.9	51.1	57.2	54.7	63.1
Coarse Sand	*8.9*	*7.5*	*3.4*	*1.6*	*17*	*7.3*	*11.6*
Medium Sand	*19.5*	*15*	*7.8*	*10.1*	*20.5*	*19.7*	*20.9*
Fine Sand	*29.6*	*40.7*	*40.7*	*39.4*	*19.7*	*27.7*	*30.6*
Silt	15.3	23.8	18.1	24.3	13.2	11.0	5.2
Clay	11.4	9.1	21.6	22.9	6.8	9.2	12.3

Sand

Sample Location	KEB-4	KEB-5	KEB-7	KEB-11	KEB-15	KWB-9	KWB-9	KWB-12	KWB-12	KWB-13
Sample Name	KEB-4 (28-30)-LT	KEB-5 (48-50)-LT	KEB-7 (32-34)-LT	KEB-11 (28-30)	KEB-15 (38-40)-LT	KWB-9 (10-12)-LT	KWB-9 (50-52)-LT	KWB-12 (20-22)-LT	KWB-12 (52-54)-LT	KWB-13 (18-20)-LT
Sample Date	11/7/2003	11/7/2003	11/7/2013	11/8/2013	11/11/2013	11/6/2013	11/6/2013	11/4/2013	11/4/2013	11/5/2013
Sample Interval (ft)	(28-30)	(48-50)	(32-34)	(28-30)	(38-40)	(10-12)	(50-52)	(20-22)	(52-54)	(18-20)
Analyte %										
Gravel	21.7	2.3	14.1	52.0	2.4	12.1	1.9	25.7	3.0	24.9
Sand	71.4	89.2	82.9	41.8	90.9	81.3	88.2	68.9	93.1	59
Coarse Sand	*23.5*	*0.9*	*12.9*	*15.5*	*7.1*	*10.8*	*8.1*	*18.8*	*1.8*	*14.2*
Medium Sand	*32.1*	*25.1*	*40.4*	*18.8*	*38.1*	*37.3*	*37.6*	*34.6*	*31.3*	*29*
Fine Sand	*15.9*	*63.3*	*29.6*	*7.5*	*45.7*	*33.2*	*42.5*	*15.5*	*60.1*	*15.9*
Silt	4.1	7.6	2.2	4.3	5.1	3.8	7.8	4.5	2.8	7.7
Clay	2.8	0.9	0.8	1.9	1.6	2.8	2.1	0.9	1.1	8.4

Table 3-2 Soil Analytical Results in Fill

Sample Location	Generic Cleanup Criteria[1]	KEB-101	KEB-106	KEB-109	KEB-114
Sample Name		KEB-101(0-2)-LT	KEB-106(0-2)-LT	KEB-109(0-2)-LT	KEB-114(0-2)-LT
Sample Date		11/12/2013	11/13/2013	11/13/2013	11/12/2013
Sample Interval (ft)		(0-2)	(0-2)	(0-2)	(0-2)
VOCs (ug/Kg)					
Tetrachloroethene	100	< 62	< 67	< 63	< 65
Trichloroethene	100	1,100	< 33	< 31	410
SPLP VOCs (ug/L)					
Tetrachloroethene	5	< 1	< 1	< 1	< 1
Trichloroethene	5	1.7	< 0.5	1.3	< 0.5

Sample Location	Generic Cleanup Criteria[1]	KEB-115	KEB-116	KEB-117	KEB-118
Sample Name		KEB-115(0-2)-LT	KEB-116(0-2)-LT	KEB-117(0-2)-LT	KEB-118(0-2)-LT
Sample Date		11/12/2013	11/12/2013	11/12/2013	11/12/2013
Sample Interval (ft)		(0-2)	(0-2)	(0-2)	(0-2)
VOCs (ug/Kg)					
Tetrachloroethene	100	< 65	< 62	1,300	< 69
Trichloroethene	100	460	830	24,000	770
SPLP VOCs (ug/L)					
Tetrachloroethene	5	< 1	< 1	2.6	< 1
Trichloroethene	5	0.75	0.7	120	3.3

Sample Location	Generic Cleanup Criteria[1]	KEB-124	KEB-126	KEB-127	KEB-128
Sample Name		KEB-124(0-2)-LT	KEB-126(0-2)-LT	KEB-127(0-2)-LT	KEB-128(0-2)-LT
Sample Date		11/13/2013	11/12/2013	11/12/2013	11/12/2013
Sample Interval (ft)		(0-2)	(0-2)	(0-2)	(0-2)
VOCs (ug/Kg)					
Tetrachloroethene	100	< 68	< 67	210	< 80
Trichloroethene	100	1,100	460	3,400	820 J
SPLP VOCs (ug/L)					
Tetrachloroethene	5	< 1	< 1	< 1	< 1
Trichloroethene	5	< 0.5	< 0.5	0.93	1.7 J

Notes:

[1] MDEQ Part 201 Generic Cleanup Criteria.

< Less than the laboratory reporting limit for the analyte.

J Estimated value because compound meets the identification criteria but the result is less than the reporting limit and greater than the MDL or quality control criteria were not met.

X Estimated value, some aspect of the test relative to this compound did not meet QC criteria. See batch narrative in Appendix D for explanation.

Table 3-2 Soil Analytical Results in Fill

Sample Location	Generic Cleanup Criteria[1]	KEB-128	KEB-129	KEB-133	KEB-137
Sample Name		DUP-10-11122013	KEB-129(0-2)-LT	KEB-133(0-2)-LT	KEB-137(0-2)-LT
Sample Date		11/12/2013	11/12/2013	11/12/2013	11/11/2013
Sample Interval (ft)		(0-2)	(0-2)	(0-2)	(0-2)
Total VOCs (ug/Kg)					
Tetrachloroethene	100	< 77	960	< 64	< 63
Trichloroethene	100	230 J	3,700	1,200	1,500
SPLP VOCs (ug/L)					
Tetrachloroethene	5	< 1	1	< 1	< 1
Trichloroethene	5	7.7 J	12	2.4	3.1

Sample Location	Generic Cleanup Criteria[1]	KEB-139	KEB-140	KEB-140	KEB-145
Sample Name		KEB-139(0-2)-LT	KEB-140(0-2)-LT	DUP-11-11122013	KEB-145(0-2)-LT
Sample Date		11/12/2013	11/12/2013	11/12/2013	11/11/2013
Sample Interval (ft)		(0-2)	(0-2)	(0-2)	(0-2)
Total VOCs (ug/Kg)					
Tetrachloroethene	100	540	< 94	< 91	370
Trichloroethene	100	460	< 47	< 45	1,300
SPLP VOCs (ug/L)					
Tetrachloroethene	5	< 1	< 1	< 1	0.81 J
Trichloroethene	5	< 0.5	< 0.5	< 0.5	2

Sample Location	Generic Cleanup Criteria[1]	KEB-149	KEB-156	KEB-26	KEB-62
Sample Name		KEB-149(0-2)-LT	KEB-156(0-2)-LT	KEB-26(0-2)-LT	KEB-62(0-2)-LT
Sample Date		11/12/2013	11/12/2013	11/13/2013	11/13/2013
Sample Interval (ft)		(0-2)	(0-2)	(0-2)	(0-2)
Total VOCs (ug/Kg)					
Tetrachloroethene	100	430	310	< 62	< 67
Trichloroethene	100	1,300	1,400	1,400	390
SPLP VOCs (ug/L)					
Tetrachloroethene	5	< 1	0.55 J	< 1	< 1
Trichloroethene	5	5.6	3.6	5.6	< 0.5

Notes:

[1] MDEQ Part 201 Generic Cleanup Criteria.

< Less than the laboratory reporting limit for the analyte.

J Estimated value because compound meets the identification criteria but the result is less than the reporting limit and greater than the MDL or quality control criteria were not met.

X Estimated value, some aspect of the test relative to this compound did not meet QC criteria. See batch narrative in Appendix D for explanation.

Table 3-2 Soil Analytical Results in Fill

Sample Location	Generic Cleanup Criteria[1]	KEB-64	KEB-76	KEB-76	KWB-10
Sample Name		KEB-64(0-2)-LT	KEB-76(0-2)-LT	DUP-12-11122013	KWB-10(0-2)-LT
Sample Date		11/13/2013	11/12/2013	11/12/2013	11/6/2013
Sample Interval (ft)		(0-2)	(0-2)	(0-2)	(0-2)
Total VOCs (ug/Kg)					
Tetrachloroethene	100	< 65	< 60	< 59	310
Trichloroethene	100	2,800	530	860	860
SPLP VOCs (ug/L)					
Tetrachloroethene	5	< 1	< 1	< 1	2.4
Trichloroethene	5	17	< 0.5	0.5	10

Sample Location	Generic Cleanup Criteria[1]	KWB-6	KWB-6	KWB-9	KWB-10
Sample Name		KWB-6(0-2)-LT	DUP-4-11052013	KWB-9(0-2)-LT	KWB-10(1.9-2.5)-LT
Sample Date		11/5/2013	11/5/2013	11/5/2013	11/6/2013
Sample Interval (ft)		(0-2)	(0-2)	(0-2)	(1.9-2.5)
Total VOCs (ug/Kg)					
Tetrachloroethene	100	< 76	< 91	90	990
Trichloroethene	100	950	910	280	3,500
SPLP VOCs (ug/L)					
Tetrachloroethene	5	< 1	< 1	< 1	10
Trichloroethene	5	1.2	1.2	< 0.5	63

Sample Location	Generic Cleanup Criteria[1]	KWB-12	KWB-12	KWB-13	KWB-13
Sample Name		KWB-12(0-2)-LT	DUP-1-11042013	KWB-13(2.5-3)-LT	KWB-13(4-6)-LT
Sample Date		11/4/2013	11/4/2013	11/5/2013	11/5/2013
Sample Interval (ft)		(0-2)	(0-2)	(2.5-3)	(4-6)
Total VOCs (ug/Kg)					
Tetrachloroethene	100	720 J	210 J	< 61	< 52
Trichloroethene	100	8,600 J	2,300 J	190	59
SPLP VOCs (ug/L)					
Tetrachloroethene	5	< 1 J	< 1	< 1	< 1
Trichloroethene	5	5.3 J	2.9 J	2.1	1.9

Notes:

[1] MDEQ Part 201 Generic Cleanup Criteria.

< Less than the laboratory reporting limit for the analyte.

J Estimated value because compound meets the identification criteria but the result is less than the reporting limit and greater than the MDL or quality control criteria were not met.

X Estimated value, some aspect of the test relative to this compound did not meet QC criteria. See batch narrative in Appendix D for explanation.

Table 3-3 Soil Analytical Results in Sand

Sample Location	Generic Cleanup Criteria[1]	KEB-4	KEB-4	KEB-4	KEB-4
Sample Name		KEB-4(28-30)-LT	DUP-5-11072013	KEB-4(36-38)-LT	KEB-4 (38-40)-LT
Sample Date		11/7/2013	11/7/2013	11/7/2013	11/7/2013
Sample Interval (ft)		(28-30)	(28-30)	(36-38)	(38-40)
VOCs (ug/Kg)					
Tetrachloroethene	100	< 65	< 51	42 J	57
Trichloroethene	100	110 J	230 J	200	240
SPLP VOCs (ug/L)					
Tetrachloroethene	5	< 1	< 1	< 1	0.85 J
Trichloroethene	5	1.3 J	2.9 J	2.9	4.9

Sample Location	Generic Cleanup Criteria[1]	KEB-4	KEB-4	KEB-4	KEB-5
Sample Name		KEB-4 (48-50)-LT	KEB-4 (52-54)-LT	KEB-4 (56-58)-LT	KEB-5 (48-50)-LT
Sample Date		11/7/2013	11/7/2013	11/7/2013	11/7/2013
Sample Interval (ft)		(48-50)	(52-54)	(56-58)	(48-50)
VOCs (ug/Kg)					
Tetrachloroethene	100	120	190	< 58	170
Trichloroethene	100	380	550	74	830
SPLP VOCs (ug/L)					
Tetrachloroethene	5	1.1	1.6	< 1	1.2
Trichloroethene	5	4.4	7	2	11

Sample Location	Generic Cleanup Criteria[1]	KEB-5	KEB-5	KEB-5	KEB-7
Sample Name		DUP-6-11072013	KEB-5 (52-54)-LT	KEB-5 (56-58)-LT	KEB-7 (32-34)-LT
Sample Date		11/7/2013	11/7/2013	11/7/2013	11/7/2013
Sample Interval (ft)		(48-50)	(52-54)	(56-58)	(32-34)
VOCs (ug/Kg)					
Tetrachloroethene	100	220	65	160	27 J
Trichloroethene	100	1,100	320	720	220
SPLP VOCs (ug/L)					
Tetrachloroethene	5	1.5	0.91 J	5.1	< 1
Trichloroethene	5	14	7.1	4.4	2.8

Notes:

[1] MDEQ Part 201 Generic Cleanup Criteria.

< Less than the laboratory reporting limit for the analyte.

J Estimated value because compound meets the identification criteria but the result is less than the reporting limit and greater than the MDL or quality control criteria were not met.

X Estimated value, some aspect of the test relative to this compound did not meet QC criteria. See batch narrative in Appendix D for explanation.

Table 3-3 Soil Analytical Results in Sand

Sample Location	Generic Cleanup Criteria[1]	KEB-7	KEB-7	KEB-7	KEB-7
Sample Name		KEB-7 (38-40)-LT	KEB-7 (46-48)-LT	KEB-7(48-50)-LT	KEB-7(56-58)-LT
Sample Date		11/8/2013	11/8/2013	11/8/2013	11/8/2013
Sample Interval (ft)		(38-40)	(46-48)	(48-50)	(56-58)
VOCs (ug/Kg)					
Tetrachloroethene	100	< 59	110	79	74
Trichloroethene	100	130	580	410	340
SPLP VOCs (ug/L)					
Tetrachloroethene	5	< 1	< 1	< 1	< 1
Trichloroethene	5	4.2	4.2	5.7	5.2

Sample Location	Generic Cleanup Criteria[1]	KEB-11	KEB-11	KEB-11	KEB-11
Sample Name		KEB-11(8-10)-LT	DUP-7-11082013	KEB-11(18-20)-LT	KEB-11(28-30)-LT
Sample Date		11/8/2013	11/8/2013	11/8/2013	11/8/2013
Sample Interval (ft)		(8-10)	(8-10)	(18-20)	(28-30)
VOCs (ug/Kg)					
Tetrachloroethene	100	< 51	< 55	< 54	120
Trichloroethene	100	130	88	190	450
SPLP VOCs (ug/L)					
Tetrachloroethene	5	< 1	< 1	< 1	1
Trichloroethene	5	3	1.9	3.8	6.3

Sample Location	Generic Cleanup Criteria[1]	KEB-11	KEB-11	KEB-11	KEB-15
Sample Name		KEB-11(38-40)-LT	KEB-11(48-50)-LT	KEB-11(56-58)-LT	KEB-15(28-30)-LT
Sample Date		11/8/2013	11/8/2013	11/8/2013	11/11/2013
Sample Interval (ft)		(38-40)	(48-50)	(56-58)	(28-30)
VOCs (ug/Kg)					
Tetrachloroethene	100	110	260	180	< 55
Trichloroethene	100	300	570	340	330
SPLP VOCs (ug/L)					
Tetrachloroethene	5	1.8	3.1	2.6	< 1
Trichloroethene	5	6.6	9.5	7.3	6.8

Notes:

[1] MDEQ Part 201 Generic Cleanup Criteria.

< Less than the laboratory reporting limit for the analyte.

J Estimated value because compound meets the identification criteria but the result is less than the reporting limit and greater than the MDL or quality control criteria were not met.

X Estimated value, some aspect of the test relative to this compound did not meet QC criteria. See batch narrative in Appendix D for explanation.

Table 3-3 Soil Analytical Results in Sand

Sample Location	Generic Cleanup Criteria[(1)]	KEB-15	KEB-15	KEB-15	KEB-15
Sample Name		DUP-8-11112013	KEB-15(32-32.5)-LT	KEB-15(38-40)-LT	DUP-9-11112013
Sample Date		11/11/2013	11/11/2013	11/11/2013	11/11/2013
Sample Interval (ft)		(28-30)	(32-32.5)	(38-40)	(38-40)
VOCs (ug/Kg)					
Tetrachloroethene	100	< 60	54	72 J	180 J
Trichloroethene	100	350	350	400	660
SPLP VOCs (ug/L)					
Tetrachloroethene	5	< 1	< 1	1.1 J	8.2 J
Trichloroethene	5	6.4	5.8	5.7 J	11 J

Sample Location	Generic Cleanup Criteria[(1)]	KEB-15	KEB-15	KWB-9	KWB-9
Sample Name		KEB-15(48-50)-LT	KEB-15(56-58)-LT	KWB-9(6-8)-LT	KWB-9(10-12)-LT
Sample Date		11/11/2013	11/11/2013	11/5/2013	11/5/2013
Sample Interval (ft)		(48-50)	(56-58)	(6-8)	(10-12)
VOCs (ug/Kg)					
Tetrachloroethene	100	170	130	34 J	< 57
Trichloroethene	100	450	350	34	16 J
SPLP VOCs (ug/L)					
Tetrachloroethene	5	0.94 J	0.93 J	< 1	1.3
Trichloroethene	5	4.9	4.1	< 0.5	< 0.5

Sample Location	Generic Cleanup Criteria[(1)]	KWB-9	KWB-9	KWB-10	KWB-10
Sample Name		KWB-9(32-34)-LT	KWB-9(44-46)-LT	KWB-10(14-16)-LT	KWB-10(25-27)-LT
Sample Date		11/6/2013	11/6/2013	11/6/2013	11/6/2013
Sample Interval (ft)		(32-34)	(44-46)	(14-16)	(25-27)
VOCs (ug/Kg)					
Tetrachloroethene	100	100	150	540	64
Trichloroethene	100	100	120	1500	280
SPLP VOCs (ug/L)					
Tetrachloroethene	5	1.7	1.6	7.1	0.9 J
Trichloroethene	5	2.3	1.9	38	5.5

Notes:

[(1)] MDEQ Part 201 Generic Cleanup Criteria.

< Less than the laboratory reporting limit for the analyte.

J Estimated value because compound meets the identification criteria but the result is less than the reporting limit and greater than the MDL or quality control criteria were not met.

X Estimated value, some aspect of the test relative to this compound did not meet QC criteria. See batch narrative in Appendix D for explanation.

Table 3-3 Soil Analytical Results in Sand

Sample Location	Generic Cleanup Criteria[(1)]	KWB-9	KWB-9	KWB-10	KWB-10
Sample Name		KWB-9(50-52)-LT	KWB-9(58-60)-LT	KWB-10(35-37)-LT	KWB-10(40-42)-LT
Sample Date		11/6/2013	11/6/2013	11/6/2013	11/6/2013
Sample Interval (ft)		(50-52)	(58-60)	(35-37)	(40-42)
VOCs (ug/Kg)					
Tetrachloroethene	100	440	150	280	67
Trichloroethene	100	300	110	830	130
SPLP VOCs (ug/L)					
Tetrachloroethene	5	3.7	1.1	4	0.69 J
Trichloroethene	5	4.4	1.3	21	2

Sample Location	Soil Cleanup Criteria[1]	KWB-10	KWB-12	KWB-12	KWB-12
Sample Name		KWB-10(50-52)-LT	KWB-12(20-22)-LT	KWB-12(30-32)-LT	KWB-12(40-42)-LT
Sample Date		11/6/2013	11/4/2013	11/4/2013	11/4/2013
Sample Interval (ft)		(50-52)	(20-22)	(30-32)	(40-42)
Total VOCs (ug/Kg)					
Tetrachloroethene	100	110	36 J	250 J	110
Trichloroethene	100	200	280	7000 J	220
SPLP VOCs (ug/L)					
Tetrachloroethene	5	1.1	1.1	1.4 J	1.6
Trichloroethene	5	3.5	4.7	15 J	3.8

Sample Location	Generic Cleanup Criteria[(1)]	KWB-12	KWB-12	KWB-13	KWB-13
Sample Name		KWB-12(52-54)-LT	KWB-12(58-59)-LT	KWB-13(18-20)-LT	KWB-13(20-22)-LT
Sample Date		11/4/2013	11/4/2013	11/5/2013	11/5/2013
Sample Interval (ft)		(52-54)	(58-59)	(18-20)	(20-22)
VOCs (ug/Kg)					
Tetrachloroethene	100	210	170	< 53	< 56
Trichloroethene	100	320	250	110	110
SPLP VOCs (ug/L)					
Tetrachloroethene	5	2.6	1.9	< 1	< 1
Trichloroethene	5	5.4	3.9	1.3	1.7

Notes:

[(1)] MDEQ Part 201 Generic Cleanup Criteria.

< Less than the laboratory reporting limit for the analyte.

J Estimated value because compound meets the identification criteria but the result is less than the reporting limit and greater than the MDL or quality control criteria were not met.

X Estimated value, some aspect of the test relative to this compound did not meet QC criteria. See batch narrative in Appendix D for explanation.

Table 3-3 Soil Analytical Results in Sand

Sample Location	Generic Cleanup Criteria[1]	KWB-13	KWB-13	KWB-13	KWB-13
Sample Name		DUP-2-11052013	KWB-13(38-40)-LT	DUP-3-11052013	KWB-13(48-50)-LT
Sample Date		11/5/2013	11/5/2013	11/5/2013	11/5/2013
Sample Interval (ft)		(20-22)	(38-40)	(38-40)	(48-50)
VOCs (ug/Kg)					
Tetrachloroethene	100	< 57	49 J	80	65
Trichloroethene	100	95	180 J	310 J	200
SPLP VOCs (ug/L)					
Tetrachloroethene	5	< 1	0.92 J	1.1	1.2
Trichloroethene	5	1.1	4.8	3.4	4.1

Sample Location	Generic Cleanup Criteria[1]	KWB-13
Sample Name		KWB-13(50-52)-LT
Sample Date		11/5/2013
Sample Interval (ft)		(50-52)
VOCs (ug/Kg)		
Tetrachloroethene	100	77
Trichloroethene	100	250
SPLP VOCs (ug/L)		
Tetrachloroethene	5	0.98 J
Trichloroethene	5	5.1

Notes:

[1] MDEQ Part 201 Generic Cleanup Criteria.

< Less than the laboratory reporting limit for the analyte.

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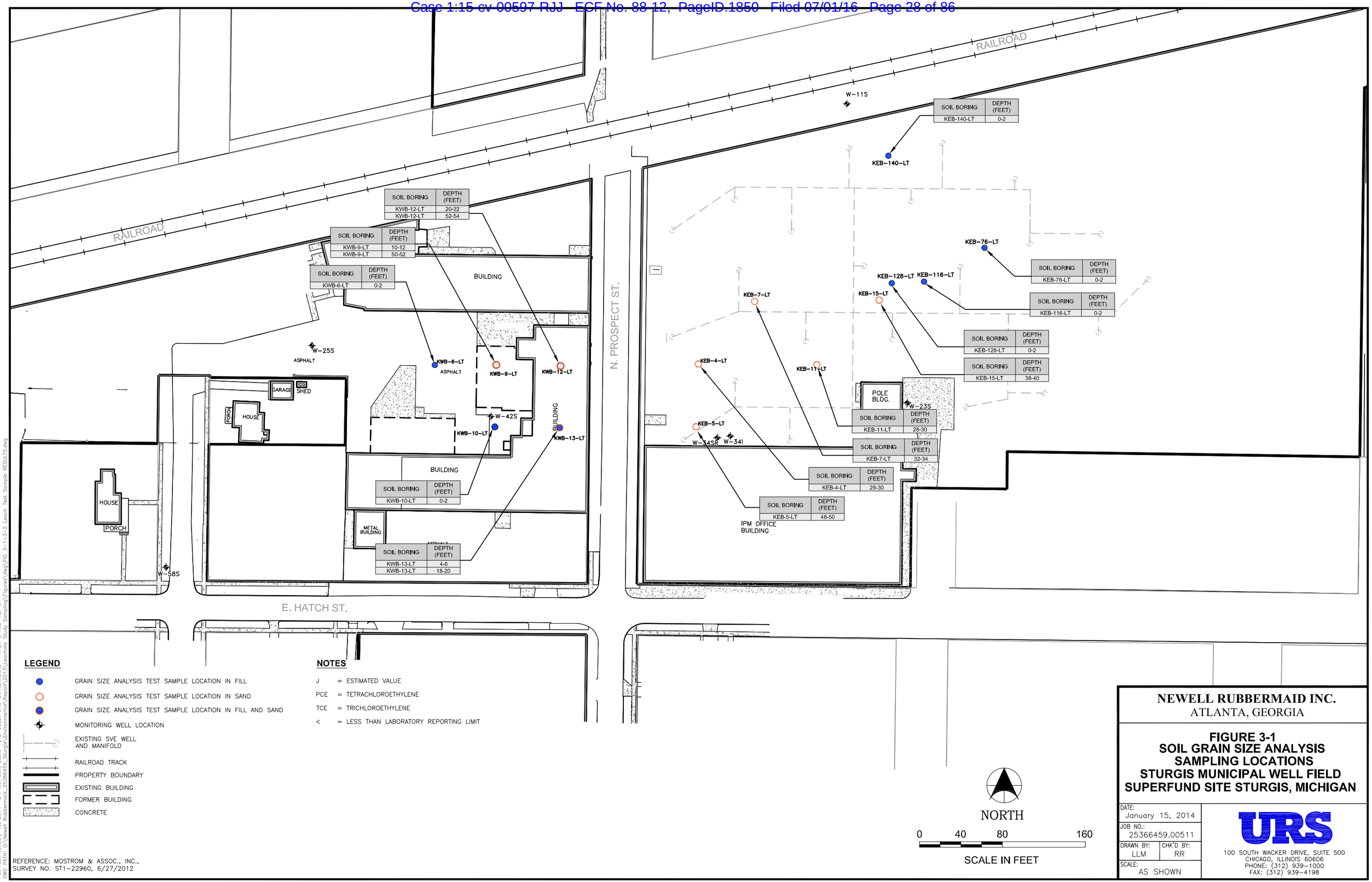
X Estimated value, some aspect of the test relative to this compound did not meet QC criteria. See batch narrative in Appendix D for explanation.



LEGEND

- GRAIN SIZE ANALYSIS TEST SAMPLE LOCATION IN FILL
- GRAIN SIZE ANALYSIS TEST SAMPLE LOCATION IN SAND
- GRAIN SIZE ANALYSIS TEST SAMPLE LOCATION IN FILL AND SAND
- MONITORING WELL LOCATION
- EXISTING SVE WELL AND MANIFOLD
- RAILROAD TRACK
- PROPERTY BOUNDARY
- EXISTING BUILDING
- FORMER BUILDING
- CONCRETE

NOTES

J = ESTIMATED VALUE
PCE = TETRACHLOROETHYLENE
TCE = TRICHLOROETHYLENE
< = LESS THAN LABORATORY REPORTING LIMIT

REFERENCE: MOSTROM & ASSOC., INC., SURVEY NO. ST1-22960, 6/27/2012

NORTH

0 40 80 160

SCALE IN FEET

NEWELL RUBBERMAID INC.
ATLANTA, GEORGIA

FIGURE 3-1
SOIL GRAIN SIZE ANALYSIS SAMPLING LOCATIONS
STURGIS MUNICIPAL WELL FIELD
SUPERFUND SITE STURGIS, MICHIGAN

DATE: January 15, 2014	
JOB NO.: 25366459.00511	
DRAWN BY: LLM	CHK'D BY: RR
SCALE: AS SHOWN	

URS
100 SOUTH WACKER DRIVE, SUITE 500
CHICAGO, ILLINOIS 60606
PHONE: (312) 939-1000
FAX: (312) 939-4198

KWB-12-LT				
DEPTH (FEET)	TCE (ug/Kg)	PCE (ug/Kg)	SPLP TCE (ug/L)	SPLP PCE (ug/L)
0-2	8,600 J	720 J	5.3 J	<1 J
0-2(DUP)	2,300 J	210 J	2.9 J	<1

KWB-9-LT				
DEPTH (FEET)	TCE (ug/Kg)	PCE (ug/Kg)	SPLP TCE (ug/L)	SPLP PCE (ug/L)
0-2	280	90	<0.5	<1

KWB-6-LT				
DEPTH (FEET)	TCE (ug/Kg)	PCE (ug/Kg)	SPLP TCE (ug/L)	SPLP PCE (ug/L)
0-2	950	<76	1.2	<1
0-2(DUP)	910	<91	1.2	<1

KWB-10-LT				
DEPTH (FEET)	TCE (ug/Kg)	PCE (ug/Kg)	SPLP TCE (ug/L)	SPLP PCE (ug/L)
1.9-2.5	3,500	990	63	10
0-2	860	310	10	2.4

KWB-13-LT				
DEPTH (FEET)	TCE (ug/Kg)	PCE (ug/Kg)	SPLP TCE (ug/L)	SPLP PCE (ug/L)
0-2	190	<61	2.1	<1
4-6	59	<52	1.9	1

KEB-140-LT				
DEPTH (FEET)	TCE (ug/Kg)	PCE (ug/Kg)	SPLP TCE (ug/L)	SPLP PCE (ug/L)
0-2	<47	<94	<0.5	<1
0-2(DUP)	<45	<91	<0.5	<1

KEB-139-LT				
DEPTH (FEET)	TCE (ug/Kg)	PCE (ug/Kg)	SPLP TCE (ug/L)	SPLP PCE (ug/L)
0-2	460	540	<0.5	<1

KEB-129-LT				
DEPTH (FEET)	TCE (ug/Kg)	PCE (ug/Kg)	SPLP TCE (ug/L)	SPLP PCE (ug/L)
0-2	3,700	960	12	1

KEB-149-LT				
DEPTH (FEET)	TCE (ug/Kg)	PCE (ug/Kg)	SPLP TCE (ug/L)	SPLP PCE (ug/L)
0-2	1,300	430	5.6	<1

KEB-156-LT				
DEPTH (FEET)	TCE (ug/Kg)	PCE (ug/Kg)	SPLP TCE (ug/L)	SPLP PCE (ug/L)
0-2	1,400	310	3.6	0.55 J

KEB-118-LT				
DEPTH (FEET)	TCE (ug/Kg)	PCE (ug/Kg)	SPLP TCE (ug/L)	SPLP PCE (ug/L)
0-2	770	<69	3.3	1

KEB-106-LT				
DEPTH (FEET)	TCE (ug/Kg)	PCE (ug/Kg)	SPLP TCE (ug/L)	SPLP PCE (ug/L)
0-2	33	<67	<0.5	<1

KEB-117-LT				
DEPTH (FEET)	TCE (ug/Kg)	PCE (ug/Kg)	SPLP TCE (ug/L)	SPLP PCE (ug/L)
0-2	24,000	1,300	120	2.6

KEB-124-LT				
DEPTH (FEET)	TCE (ug/Kg)	PCE (ug/Kg)	SPLP TCE (ug/L)	SPLP PCE (ug/L)
0-2	770	<69	3.3	<1

KEB-62-LT				
DEPTH (FEET)	TCE (ug/Kg)	PCE (ug/Kg)	SPLP TCE (ug/L)	SPLP PCE (ug/L)
0-2	390	<67	<0.5	<1

KEB-26-LT				
DEPTH (FEET)	TCE (ug/Kg)	PCE (ug/Kg)	SPLP TCE (ug/L)	SPLP PCE (ug/L)
0-2	1,400	<62	5.6	<1

KEB-64-LT				
DEPTH (FEET)	TCE (ug/Kg)	PCE (ug/Kg)	SPLP TCE (ug/L)	SPLP PCE (ug/L)
0-2	2,800	<65	17	<1

KEB-76-LT				
DEPTH (FEET)	TCE (ug/Kg)	PCE (ug/Kg)	SPLP TCE (ug/L)	SPLP PCE (ug/L)
0-2	530	<60	<0.5	<1
0-2 (DUP)	860	<59	0.5	<1

KEB-109-LT				
DEPTH (FEET)	TCE (ug/Kg)	PCE (ug/Kg)	SPLP TCE (ug/L)	SPLP PCE (ug/L)
0-2	<31	<63	1.3	<1

KEB-101-LT				
DEPTH (FEET)	TCE (ug/Kg)	PCE (ug/Kg)	SPLP TCE (ug/L)	SPLP PCE (ug/L)
0-2	1,100	<62	1.7	<1

KEB-114-LT				
DEPTH (FEET)	TCE (ug/Kg)	PCE (ug/Kg)	SPLP TCE (ug/L)	SPLP PCE (ug/L)
0-2	410	<65	<0.5	<1

KEB-115-LT				
DEPTH (FEET)	TCE (ug/Kg)	PCE (ug/Kg)	SPLP TCE (ug/L)	SPLP PCE (ug/L)
0-2	460	<65	0.75	<1

KEB-126-LT				
DEPTH (FEET)	TCE (ug/Kg)	PCE (ug/Kg)	SPLP TCE (ug/L)	SPLP PCE (ug/L)
0-2	460	<67	<0.5	<1

KEB-116-LT				
DEPTH (FEET)	TCE (ug/Kg)	PCE (ug/Kg)	SPLP TCE (ug/L)	SPLP PCE (ug/L)
0-2	830	<62	0.7	<1

KEB-133-LT				
DEPTH (FEET)	TCE (ug/Kg)	PCE (ug/Kg)	SPLP TCE (ug/L)	SPLP PCE (ug/L)
0-2	1,200	<64	2.4	<1

KEB-127-LT				
DEPTH (FEET)	TCE (ug/Kg)	PCE (ug/Kg)	SPLP TCE (ug/L)	SPLP PCE (ug/L)
0-2	3,400	210	0.93	<1

KEB-128-LT				
DEPTH (FEET)	TCE (ug/Kg)	PCE (ug/Kg)	SPLP TCE (ug/L)	SPLP PCE (ug/L)
0-2	820 J	<80	1.7 J	<1
0-2 (DUP)	230 J	77	7.7 J	<1

KEB-137-LT				
DEPTH (FEET)	TCE (ug/Kg)	PCE (ug/Kg)	SPLP TCE (ug/L)	SPLP PCE (ug/L)
0-2	1,500	<63	3.1	<1

KEB-145-LT				
DEPTH (FEET)	TCE (ug/Kg)	PCE (ug/Kg)	SPLP TCE (ug/L)	SPLP PCE (ug/L)
0-2	1,300	370	2	0.81 J

RAILROAD
BUILDING
N. PROSPECT ST.
ASPHALT
KWB-6-LT
KWB-9-LT
KWB-12-LT
W-25S
GARAGE
SHED
KWB-10-LT
W-42S
KWB-13-LT
BUILDING
HOUSE
PORCH
W-58S
METAL BUILDING
ASPHALT
E. HATCH ST.
GARAGE
W-11S
KEB-140-LT
KEB-156-LT
KEB-149-LT
KEB-139-LT
KEB-129-LT
KEB-118-LT
KEB-106-LT
KEB-124-LT
KEB-62-LT
KEB-26-LT
KEB-64-LT
KEB-76-LT
KEB-117-LT
KEB-128-LT
KEB-116-LT
KEB-109-LT
KEB-101-LT
KEB-115-LT
KEB-114-LT
KEB-137-LT
KEB-127-LT
KEB-133-LT
KEB-126-LT
KEB-145-LT
POLE BLDG.
W-23S
W-34SR
W-34I
IPM OFFICE BUILDING

LEGEND

- LEACHATE TEST SAMPLE LOCATION IN FILL
- MONITORING WELL LOCATION
- EXISTING SVE WELL AND MANIFOLD
- RAILROAD TRACK
- PROPERTY BOUNDARY
- EXISTING BUILDING
- FORMER BUILDING
- CONCRETE

NOTES

J = ESTIMATED VALUE
PCE = TETRACHLOROETHYLENE
TCE = TRICHLOROETHYLENE
< = LESS THAN LABORATORY REPORTING LIMIT

REFERENCE: MOSTROM & ASSOC., INC., SURVEY NO. ST1-22960, 6/27/2012

NORTH

0 40 80 160

SCALE IN FEET

NEWELL RUBBERMAID INC.
ATLANTA, GEORGIA

FIGURE 3-2
SOIL ANALYTICAL RESULTS IN FILL
STURGIS MUNICIPAL WELL FIELD
SUPERFUND SITE STURGIS, MICHIGAN

DATE: January 15, 2014
JOB NO.: 25366459.00511
DRAWN BY: LLM
CHK'D BY: RR
SCALE: AS SHOWN

URS
100 SOUTH WACKER DRIVE, SUITE 500
CHICAGO, ILLINOIS 60606
PHONE: (312) 939-1000
FAX: (312) 939-4198

RAILROAD

RAILROAD

W-11S

N. PROSPECT ST.

BUILDING

ASPHALT

W-25S

GARAGE

SHED

HOUSE

PORCH

KWB-9-LT

KWB-12-LT

W-42S

KWB-10-LT

KWB-13-LT

BUILDING

BUILDING

METAL BUILDING

ASPHALT

W-58S

E. HATCH ST.

GARAGE

KEB-7-LT

KEB-15-LT

KEB-4-LT

KEB-11-LT

KEB-5-LT

W-34SR

W-34I

POLE BLDG.

W-28S

IPM OFFICE BUILDING

KWB-12-LT

DEPTH (FEET)	TCE (ug/Kg)	PCE (ug/Kg)	SPLP TCE (ug/L)	SPLP PCE (ug/L)
20-22	280	36 J	4.7	1.1
30-32	7,000 J	250 J	15 J	1.4 J
40-42	220	110	3.8	1.6
52-54	320	210	5.4	2.6
58-59	250	170	3.9	1.9

KWB-9-LT

DEPTH (FEET)	TCE (ug/Kg)	PCE (ug/Kg)	SPLP TCE (ug/L)	SPLP PCE (ug/L)
6-8	34	34 J	0.5	1
10-12	16 J	<57	<0.5	1.3
32-34	100	100	2.3	1.7
44-46	120	150	1.9	1.6
50-52	300	440	4.4	3.7
58-60	110	150	1.3	1.1

KWB-10-LT

DEPTH (FEET)	TCE (ug/Kg)	PCE (ug/Kg)	SPLP TCE (ug/L)	SPLP PCE (ug/L)
14-16	1,500	540	38	7.1
25-27	280	64	5.5	0.9 J
35-37	830	280	21	4
40-42	130	67	2	0.69 J
50-52	200	110	3.5	1.1

KWB-13-LT

DEPTH (FEET)	TCE (ug/Kg)	PCE (ug/Kg)	SPLP TCE (ug/L)	SPLP PCE (ug/L)
18-20	110	<53	1.3	<1
20-22	110	<56	1.7	<1
20-22(DUP)	95	<57	1.1	<1
38-40	180 J	49 J	4.8	0.92
38-40(DUP)	310 J	80	3.4	1.1
48-50	200	65	4.1	1.2
50-52	250	77	5.1	0.98 J

KEB-4-LT

DEPTH (FEET)	TCE (ug/Kg)	PCE (ug/Kg)	SPLP TCE (ug/L)	SPLP PCE (ug/L)
28-30	110 J	<65	1.3 J	<1
28-30(DUP)	230 J	<51	2.9 J	1
36-38	200	42 J	2.9	1
38-40	240	57	4.9	0.85 J
48-50	380	120	4.4	1.1
52-54	550	190	7	1.6
56-58	74	<58	2	<1

KEB-5-LT

DEPTH (FEET)	TCE (ug/Kg)	PCE (ug/Kg)	SPLP TCE (ug/L)	SPLP PCE (ug/L)
48-50	830	170	11	1.2
48-50(DUP)	1,100	220	14	1.5
52-54	320	65	7.1	0.91 J
56-58	720	160	4.4	5.1

KEB-7-LT

DEPTH (FEET)	TCE (ug/Kg)	PCE (ug/Kg)	SPLP TCE (ug/L)	SPLP PCE (ug/L)
32-34	220	27 J	2.8	<1
38-40	130	<59	4.2	<1
46-48	580	110	4.2	<1
48-50	410	79	5.7	<1
56-58	340	74	5.2	<1

KEB-15-LT

DEPTH (FEET)	TCE (ug/Kg)	PCE (ug/Kg)	SPLP TCE (ug/L)	SPLP PCE (ug/L)
28-30	330	<55	6.8	<1
28-30(DUP)	350	<60	6.4	<1
32-32.5	350	54	5.8	<1
38-40	400	72 J	5.7 J	1.1 J
38-40(DUP)	660	180 J	11 J	8.2 J
48-50	450	170	4.9	0.94 J
56-58	350	130	4.1	0.93 J

KEB-11-LT

DEPTH (FEET)	TCE (ug/Kg)	PCE (ug/Kg)	SPLP TCE (ug/L)	SPLP PCE (ug/L)
8-10	130	<51	3	<1
8-10 (DUP)	88	<55	1.9	<1
18-20	190	<54	3.8	<1
28-30	450	120	6.3	1
38-40	300	110	6.6	1.8
48-50	570	260	9.5	3.1
56-58	340	180	7.3	2.6

LEGEND

- LEACHATE TEST SAMPLE LOCATION IN SAND
- MONITORING WELL LOCATION
- EXISTING SVE WELL AND MANIFOLD
- RAILROAD TRACK
- PROPERTY BOUNDARY
- EXISTING BUILDING
- FORMER BUILDING
- CONCRETE

NOTES

J = ESTIMATED VALUE

PCE = TETRACHLOROETHYLENE

TCE = TRICHLOROETHYLENE

< = LESS THAN LABORATORY REPORTING LIMIT

REFERENCE: MOSTROM & ASSOC., INC., SURVEY NO. ST1-22960, 6/27/2012

NORTH

0 40 80 160

SCALE IN FEET

NEWELL RUBBERMAID INC.
ATLANTA, GEORGIA

FIGURE 3-3
SOIL ANALYTICAL RESULTS IN SAND
STURGIS MUNICIPAL WELL FIELD
SUPERFUND SITE STURGIS, MICHIGAN

DATE: January 15, 2014
JOB NO.: 25366459.00511
DRAWN BY: LLM | CHK'D BY: RR
SCALE: AS SHOWN

URS
100 SOUTH WACKER DRIVE, SUITE 500
CHICAGO, ILLINOIS 60606
PHONE: (312) 939-1000
FAX: (312) 939-4198

PLOTTED: January 15, 2014 BY: Morrison, Leslie CTB USED: URS-STANDARD.ctb PAPER SPACE TAB: 3-3
DWG PATH: Q:\Newell Rubbermaid_25366459_Sturgis\Environmental\Report\2013\Leachate Study Sampling\Figures\dwg\FIG 3-1-3-2 Leach Test Sample RESULTS.dwg

4.0 DATA EVALUATION

This section evaluates the soil and leachate data from two soil types (fill and sand) for TCE and PCE in comparison to the generic soil and groundwater cleanup criteria. In addition, this section uses statistical analysis to determine a site-specific relationship between the soil and leachate TCE and PCE concentrations in fill and sand in order to develop new soil cleanup criteria for TCE and PCE that are protective of groundwater.

4.1 Comparison of Soil and Leach Sampling Results to Generic Cleanup Criteria

The soil TCE and PCE concentrations in fill and sand were compared to the generic soil cleanup criterion for protection of groundwater (100 ug/Kg). Similarly, the leachate TCE and PCE concentrations in fill and sand were compared to the generic groundwater cleanup criterion (5 ug/L). The comparison of TCE and PCE results in soil and the leachate to the cleanup criteria are summarized in **Tables 4-1** and **4-2** for fill and sand, respectively. The soil and groundwater cleanup criteria are provided in the RRD Operational Memorandum No. 1 (MDEQ, 2004b). It should be noted the soil cleanup criterion was established as 20 times the groundwater cleanup criterion.

4.1.1 Fill

The comparison of TCE and PCE results in soil and the leachate for the fill material to the cleanup criteria are summarized in **Table 4-1** and are also presented in **Figure 4-1**. TCE concentrations in soil exceeded the soil cleanup criterion in 31 of the 36 samples (including five duplicates) collected in the fill material. TCE concentrations in the leachate exceeded the groundwater cleanup criterion in nine of the 36 samples (including five duplicates). Similarly, PCE concentrations in soil exceeded the soil cleanup criterion in 11 of the 36 samples (including five duplicates) collected in the fill material. PCE concentrations in the leachate exceeded the groundwater cleanup criterion in only one of the 36 samples (including five duplicates).

4.1.2 Sand

The comparison of TCE and PCE results in soil and the leachate for the sandy soil to the cleanup criteria are summarized in **Table 4-2** and presented in **Figure 4-2**. TCE concentrations in soil exceeded the soil cleanup criterion in 47 of the 53 samples (including seven duplicates) collected in the sandy soil. TCE concentrations in the leachate exceeded the groundwater cleanup criterion in 21 of the 53 samples (including seven duplicates). Similarly, PCE concentrations in soil exceeded the soil cleanup criterion in 23 of the 53 samples (including seven duplicates) collected in the sandy soil. PCE concentrations in the leachate exceeded the groundwater cleanup criterion in three of the 53 samples (including seven duplicates).

4.2 Statistical Analysis of Soil and Leachate Results

An initial exploratory data analysis and graphical display of paired PCE soil and leachate sample results did not indicate a strong correlation in the fill material or the sandy soil.

Therefore, no further statistical analysis was performed for soil and leachate PCE sample results. The generic soil cleanup criterion of 100 mg/Kg for PCE will be used as the cleanup criterion for the fill material and sandy soil.

For the TCE data sets, a separate regression analysis was used to determine the relationship between soil and leachate TCE concentrations for the two soil types, fill material and sandy soil. These regression analyses are listed as follows:

- Fill material – Use of Akritas-Theil-Sen (ATS) non-parametric regression technique
- Sandy Soil – Use of Generalized Linear Model (GLM)

For this evaluation, field duplicates were excluded to ensure data independence. The remaining soil and leachate TCE data (including non-detect results and outliers) were included in the statistical analysis.

The following sections provide details on the statistical methods that were used to analyze TCE soil and leachate results for the fill material and sandy soil. The results of the statistical evaluation for TCE in the fill material and sand soil, including output sheets, are provided in **Appendix E**.

4.2.1 TCE in Fill

A total of 31 soil and leachate paired samples (not including duplicate samples) were analyzed for TCE in fill during the leach testing activities. Of these sample results, three soil results and nine leachate results were reported to be non-detects (i.e., censored or "less-than" values). The soil and leachate TCE results for the fill material are summarized in **Table 4-3**.

In this regression analysis, the data set for TCE in soil (the dependent variable, y), and the data set for TCE in leachate (the independent variable, x) were both censored (i.e., doubly censored), and the percent of non-detects was relatively large. In such cases, Helsel (2012) recommends the use of a non-parametric regression technique to properly account for censored data. The ATS method, which is a non-parametric regression technique, was used to analyze the TCE soil and leachate data in accordance with recommendations provided by Helsel (2012). Furthermore, the ATS method was found to be insensitive to potential outliers in this data set. The statistical findings using the ATS method were consistent with and without inclusion of the maximum value of 24,000 ug/Kg for TCE concentration in soil.

The R statistical programming language was used to perform the ATS regression. Specifically, the *cenken* function from the NADA package was used to derive the intercept and slope of the ATS regression, and a bootstrap method based on 10,000 trials was used to derive the one-sided 5% lower confidence limit (LCL) of the slope. For the bootstrap method, the adjusted bootstrap percentile (BCa) estimate was selected for LCL.

4.2.2 TCE in Sand

A total of 46 soil and leachate paired samples (not including duplicate samples) were analyzed for TCE in sand during the leach testing activities. Of these sample results, two leachate results were reported to be non-detects. There were no non-detect results for TCE in soil. The soil and leachate TCE results for the sandy soil are summarized in **Table 4-4**.

In this regression analysis, a traditional GLM was utilized because there are a small number of censored data points. This model is also suitable when the variance is not constant and/or the errors are not normally distributed, as is the case with this data set. It was assessed that the gamma error structure with identity link function was appropriate for this model. Similar to TCE soil and leachate results in the fill material, the soil TCE concentration is the dependent variable (y), while the leachate TCE concentration is the independent variable (x).

The R statistical programming language was used to perform the GLM regression. Specifically, the *glm* function from the R basic package was used to derive the intercept and slope of the GLM regression, and the *confint* function was used to derive the one-sided 5% LCL of the slope.

4.3 Determination of New Soil Cleanup Criteria for TCE using Regression Analyses

In evaluating the TCE data, a statistically significant relationship was observed between the soil and leachate TCE concentrations in both the fill material and sandy soil. Therefore, new soil cleanup criteria were determined using the aforementioned regression analyses for both types of soil. The statistical results and the new soil cleanup criteria for TCE in the fill material and sandy soil are discussed below.

4.3.1 ATS Regression for TCE in Fill

The soil TCE concentration corresponding to the generic groundwater cleanup criterion of 5 ug/L was calculated directly from the one-sided 5% LCL of the slope estimate of the ATS regression (i.e., 5 × LCL of slope). The ATS regression results and calculation of the new soil cleanup criterion are summarized as follows:

- Number of paired soil and leachate data points used in analysis: 31 (includes outliers, but does not include field duplicates)
- Statistical method: ATS regression
- Regression equation: Soil (ug/Kg) = 196.5517 × Leachate (ug/L) + 413.7931
- Best estimate of the slope: 196.5517
- Soil TCE concentration corresponding to a leachate TCE concentration of 5 ug/L, based on best estimate of the slope: 196.5517 × 5 = 983 ug/Kg
- One-sided 5% LCL of the slope: 113.2
- Soil TCE concentration corresponding to a leachate TCE concentration of 5 ug/L based on LCL of the slope: 113.2 × 5 = **566** ug/Kg

The new soil cleanup criterion for TCE in the fill material, based on LCL of the slope, was determined to be **566** ug/Kg.

4.3.2 GLM Regression for TCE in Sand

The soil TCE concentration corresponding to the generic groundwater cleanup criterion of 5 ug/L was calculated directly from the one-sided 5% LCL of the slope estimate of the GLM

regression (i.e., 5 × LCL of slope). The GLM regression results and calculation of the new soil cleanup criterion are summarized as follows:

- Number of paired soil and leachate data points used in analysis: 46 (includes outlier, but does not include field duplicates)
- Statistical method: GLM regression with Gamma family error structure and Identity link
- Regression equation: Soil (ug/Kg) = 78.02 × Leachate (ug/L) - 15.12
- Best estimate of the slope: 78.02
- Soil TCE concentration corresponding to a leachate TCE concentration of 5 ug/L, based on best estimate of the slope: 78.02 × 5 = 390 ug/Kg
- One-sided 5% LCL of the slope: 60.73
- Soil goal for leachate of 5 ug/L, based on LCL of the slope: 60.73 × 5 = **304** ug/Kg

The new soil cleanup criterion for TCE in the sandy soil, based on an LCL of the slope, was determined to be **304** ug/Kg.

Table 4-1 Comparison of Soil analytical Results in Fill To Cleanup Criteria

Sample Location	Generic Cleanup Criteria[(1)]	KEB-101	KEB-106	KEB-109	KEB-114
Sample Name		KEB-101(0-2)-LT	KEB-106(0-2)-LT	KEB-109(0-2)-LT	KEB-114(0-2)-LT
Sample Date		11/12/2013	11/13/2013	11/13/2013	11/12/2013
Sample Interval (ft)		(0-2)	(0-2)	(0-2)	(0-2)
VOCs (ug/Kg)					
Tetrachloroethene	100	< 62	< 67	< 63	< 65
Trichloroethene	100	**1,100**	< 33	< 31	**410**
SPLP VOCs (ug/L)					
Tetrachloroethene	5	< 1	< 1	< 1	< 1
Trichloroethene	5	1.7	< 0.5	1.3	< 0.5

Sample Location	Generic Cleanup Criteria[(1)]	KEB-115	KEB-116	KEB-117	KEB-118
Sample Name		KEB-115(0-2)-LT	KEB-116(0-2)-LT	KEB-117(0-2)-LT	KEB-118(0-2)-LT
Sample Date		11/12/2013	11/12/2013	11/12/2013	11/12/2013
Sample Interval (ft)		(0-2)	(0-2)	(0-2)	(0-2)
VOCs (ug/Kg)					
Tetrachloroethene	100	< 65	< 62	**1,300**	< 69
Trichloroethene	100	**460**	**830**	**24,000**	**770**
SPLP VOCs (ug/L)					
Tetrachloroethene	5	< 1	< 1	2.6	< 1
Trichloroethene	5	0.75	0.7	**120**	3.3

Sample Location	Generic Cleanup Criteria[(1)]	KEB-124	KEB-126	KEB-127	KEB-128
Sample Name		KEB-124(0-2)-LT	KEB-126(0-2)-LT	KEB-127(0-2)-LT	KEB-128(0-2)-LT
Sample Date		11/13/2013	11/12/2013	11/12/2013	11/12/2013
Sample Interval (ft)		(0-2)	(0-2)	(0-2)	(0-2)
VOCs (ug/Kg)					
Tetrachloroethene	100	< 68	< 67	**210**	< 80
Trichloroethene	100	**1,100**	**460**	**3,400**	**820** J
SPLP VOCs (ug/L)					
Tetrachloroethene	5	< 1	< 1	< 1	< 1
Trichloroethene	5	< 0.5	< 0.5	0.93	1.7 J

Notes:

[(1)] MDEQ Part 201 Generic Cleanup Criteria.

< Less than the laboratory reporting limit for the analyte.

J Estimated value because compound meets the identification criteria but the result is less than the reporting limit and greater than the MDL or quality control criteria were not met.

X Estimated value, some aspect of the test relative to this compound did not meet QC criteria. See batch narrative in Appendix D for explanation.

Bold exceeds soil or groundwater cleanup criteria.

Table 4-1 Comparison of Soil analytical Results in Fill To Cleanup Criteria

Sample Location	Generic Cleanup Criteria[(1)]	KEB-128	KEB-129	KEB-133	KEB-137
Sample Name		DUP-10-11122013	KEB-129(0-2)-LT	KEB-133(0-2)-LT	KEB-137(0-2)-LT
Sample Date		11/12/2013	11/12/2013	11/12/2013	11/11/2013
Sample Interval (ft)		(0-2)	(0-2)	(0-2)	(0-2)
Total VOCs (ug/Kg)					
Tetrachloroethene	100	< 77	**960**	< 64	< 63
Trichloroethene	100	**230** J	**3,700**	**1,200**	**1,500**
SPLP VOCs (ug/L)					
Tetrachloroethene	5	< 1	1	< 1	< 1
Trichloroethene	5	7.7 J	**12**	2.4	3.1

Sample Location	Generic Cleanup Criteria[(1)]	KEB-139	KEB-140	KEB-140	KEB-145
Sample Name		KEB-139(0-2)-LT	KEB-140(0-2)-LT	DUP-11-11122013	KEB-145(0-2)-LT
Sample Date		11/12/2013	11/12/2013	11/12/2013	11/11/2013
Sample Interval (ft)		(0-2)	(0-2)	(0-2)	(0-2)
Total VOCs (ug/Kg)					
Tetrachloroethene	100	**540**	< 94	< 91	**370**
Trichloroethene	100	**460**	< 47	< 45	**1,300**
SPLP VOCs (ug/L)					
Tetrachloroethene	5	< 1	< 1	< 1	0.81 J
Trichloroethene	5	< 0.5	< 0.5	< 0.5	2

Sample Location	Generic Cleanup Criteria[(1)]	KEB-149	KEB-156	KEB-26	KEB-62
Sample Name		KEB-149(0-2)-LT	KEB-156(0-2)-LT	KEB-26(0-2)-LT	KEB-62(0-2)-LT
Sample Date		11/12/2013	11/12/2013	11/13/2013	11/13/2013
Sample Interval (ft)		(0-2)	(0-2)	(0-2)	(0-2)
Total VOCs (ug/Kg)					
Tetrachloroethene	100	**430**	**310**	< 62	< 67
Trichloroethene	100	**1,300**	**1,400**	**1,400**	**390**
SPLP VOCs (ug/L)					
Tetrachloroethene	5	< 1	0.55 J	< 1	< 1
Trichloroethene	5	**5.6**	3.6	**5.6**	< 0.5

Notes:

[(1)] MDEQ Part 201 Generic Cleanup Criteria.

< Less than the laboratory reporting limit for the analyte.

J Estimated value because compound meets the identification criteria but the result is less than the reporting limit and greater than the MDL or quality control criteria were not met.

X Estimated value, some aspect of the test relative to this compound did not meet QC criteria. See batch narrative in Appendix D for explanation.

Bold exceeds soil or groundwater cleanup criteria.

Table 4-1 Comparison of Soil analytical Results in Fill To Cleanup Criteria

Sample Location	Generic Cleanup Criteria[1]	KEB-64	KEB-76	KEB-76	KWB-10
Sample Name		KEB-64(0-2)-LT	KEB-76(0-2)-LT	DUP-12-11122013	KWB-10(0-2)-LT
Sample Date		11/13/2013	11/12/2013	11/12/2013	11/6/2013
Sample Interval (ft)		(0-2)	(0-2)	(0-2)	(0-2)
Total VOCs (ug/Kg)					
Tetrachloroethene	100	< 65	< 60	< 59	**310**
Trichloroethene	100	**2,800**	**530**	**860**	**860**
SPLP VOCs (ug/L)					
Tetrachloroethene	5	< 1	< 1	< 1	2.4
Trichloroethene	5	**17**	< 0.5	0.5	**10**

Sample Location	Generic Cleanup Criteria[1]	KWB-6	KWB-6	KWB-9	KWB-10
Sample Name		KWB-6(0-2)-LT	DUP-4-11052013	KWB-9(0-2)-LT	KWB-10(1.9-2.5)-LT
Sample Date		11/5/2013	11/5/2013	11/5/2013	11/6/2013
Sample Interval (ft)		(0-2)	(0-2)	(0-2)	(1.9-2.5)
Total VOCs (ug/Kg)					
Tetrachloroethene	100	< 76	< 91	90	**990**
Trichloroethene	100	**950**	**910**	**280**	**3,500**
SPLP VOCs (ug/L)					
Tetrachloroethene	5	< 1	< 1	< 1	**10**
Trichloroethene	5	1.2	1.2	< 0.5	**63**

Sample Location	Generic Cleanup Criteria[1]	KWB-12	KWB-12	KWB-13	KWB-13
Sample Name		KWB-12(0-2)-LT	DUP-1-11042013	KWB-13(2.5-3)-LT	KWB-13(4-6)-LT
Sample Date		11/4/2013	11/4/2013	11/5/2013	11/5/2013
Sample Interval (ft)		(0-2)	(0-2)	(2.5-3)	(4-6)
Total VOCs (ug/Kg)					
Tetrachloroethene	100	**720** J	**210** J	< 61	< 52
Trichloroethene	100	**8,600** J	**2,300** J	**190**	59
SPLP VOCs (ug/L)					
Tetrachloroethene	5	< 1 J	< 1	< 1	< 1
Trichloroethene	5	**5.3** J	2.9 J	2.1	1.9

Notes:

[1] MDEQ Part 201 Generic Cleanup Criteria.

< Less than the laboratory reporting limit for the analyte.

J Estimated value because compound meets the identification criteria but the result is less than the reporting limit and greater than the MDL or quality control criteria were not met.

X Estimated value, some aspect of the test relative to this compound did not meet QC criteria. See batch narrative in Appendix D for explanation.

Bold exceeds soil or groundwater cleanup criteria.

Table 4-2 Comparison of Soil analytical Results in Sand To Cleanup Criteria

Sample Location	Generic Cleanup Criteria[1]	KEB-4	KEB-4	KEB-4	KEB-4
Sample Name		KEB-4(28-30)-LT	DUP-5-11072013	KEB-4(36-38)-LT	KEB-4 (38-40)-LT
Sample Date		11/7/2013	11/7/2013	11/7/2013	11/7/2013
Sample Interval (ft)		(28-30)	(28-30)	(36-38)	(38-40)
VOCs (ug/Kg)					
Tetrachloroethene	100	< 65	< 51	42 J	57
Trichloroethene	100	**110** J	**230** J	**200**	**240**
SPLP VOCs (ug/L)					
Tetrachloroethene	5	< 1	< 1	< 1	0.85 J
Trichloroethene	5	1.3 J	2.9 J	2.9	4.9

Sample Location	Generic Cleanup Criteria[1]	KEB-4	KEB-4	KEB-4	KEB-5
Sample Name		KEB-4 (48-50)-LT	KEB-4 (52-54)-LT	KEB-4 (56-58)-LT	KEB-5 (48-50)-LT
Sample Date		11/7/2013	11/7/2013	11/7/2013	11/7/2013
Sample Interval (ft)		(48-50)	(52-54)	(56-58)	(48-50)
VOCs (ug/Kg)					
Tetrachloroethene	100	**120**	**190**	< 58	**170**
Trichloroethene	100	**380**	**550**	74	**830**
SPLP VOCs (ug/L)					
Tetrachloroethene	5	1.1	1.6	< 1	1.2
Trichloroethene	5	4.4	**7**	2	**11**

Sample Location	Generic Cleanup Criteria[1]	KEB-5	KEB-5	KEB-5	KEB-7
Sample Name		DUP-6-11072013	KEB-5 (52-54)-LT	KEB-5 (56-58)-LT	KEB-7 (32-34)-LT
Sample Date		11/7/2013	11/7/2013	11/7/2013	11/7/2013
Sample Interval (ft)		(48-50)	(52-54)	(56-58)	(32-34)
VOCs (ug/Kg)					
Tetrachloroethene	100	**220**	65	**160**	27 J
Trichloroethene	100	**1,100**	**320**	**720**	**220**
SPLP VOCs (ug/L)					
Tetrachloroethene	5	1.5	0.91 J	**5.1**	< 1
Trichloroethene	5	**14**	**7.1**	4.4	2.8

Notes:

[1] MDEQ Part 201 Generic Cleanup Criteria.

< Less than the laboratory reporting limit for the analyte.

J Estimated value because compound meets the identification criteria but the result is less than the reporting limit and greater than the MDL or quality control criteria were not met.

X Estimated value, some aspect of the test relative to this compound did not meet QC criteria. See batch narrative in Appendix D for explanation.

Bold exceeds soil or groundwater cleanup criteria.

Table 4-2 Comparison of Soil analytical Results in Sand To Cleanup Criteria

Sample Location	Generic Cleanup Criteria[1]	KEB-7	KEB-7	KEB-7	KEB-7
Sample Name		KEB-7 (38-40)-LT	KEB-7 (46-48)-LT	KEB-7(48-50)-LT	KEB-7(56-58)-LT
Sample Date		11/8/2013	11/8/2013	11/8/2013	11/8/2013
Sample Interval (ft)		(38-40)	(46-48)	(48-50)	(56-58)
VOCs (ug/Kg)					
Tetrachloroethene	100	< 59	**110**	79	74
Trichloroethene	100	**130**	**580**	**410**	**340**
SPLP VOCs (ug/L)					
Tetrachloroethene	5	< 1	< 1	< 1	< 1
Trichloroethene	5	4.2	4.2	**5.7**	**5.2**

Sample Location	Generic Cleanup Criteria[1]	KEB-11	KEB-11	KEB-11	KEB-11
Sample Name		KEB-11(8-10)-LT	DUP-7-11082013	KEB-11(18-20)-LT	KEB-11(28-30)-LT
Sample Date		11/8/2013	11/8/2013	11/8/2013	11/8/2013
Sample Interval (ft)		(8-10)	(8-10)	(18-20)	(28-30)
VOCs (ug/Kg)					
Tetrachloroethene	100	< 51	< 55	< 54	**120**
Trichloroethene	100	**130**	88	**190**	**450**
SPLP VOCs (ug/L)					
Tetrachloroethene	5	< 1	< 1	< 1	1
Trichloroethene	5	3	1.9	3.8	**6.3**

Sample Location	Generic Cleanup Criteria[1]	KEB-11	KEB-11	KEB-11	KEB-15
Sample Name		KEB-11(38-40)-LT	KEB-11(48-50)-LT	KEB-11(56-58)-LT	KEB-15(28-30)-LT
Sample Date		11/8/2013	11/8/2013	11/8/2013	11/11/2013
Sample Interval (ft)		(38-40)	(48-50)	(56-58)	(28-30)
VOCs (ug/Kg)					
Tetrachloroethene	100	**110**	**260**	**180**	< 55
Trichloroethene	100	**300**	**570**	**340**	**330**
SPLP VOCs (ug/L)					
Tetrachloroethene	5	1.8	3.1	2.6	< 1
Trichloroethene	5	**6.6**	**9.5**	**7.3**	**6.8**

Notes:

[1] MDEQ Part 201 Generic Cleanup Criteria.

< Less than the laboratory reporting limit for the analyte.

J Estimated value because compound meets the identification criteria but the result is less than the reporting limit and greater than the MDL or quality control criteria were not met.

X Estimated value, some aspect of the test relative to this compound did not meet QC criteria. See batch narrative in Appendix D for explanation.

Bold exceeds soil or groundwater cleanup criteria.

Table 4-2 Comparison of Soil analytical Results in Sand To Cleanup Criteria

Sample Location	Generic Cleanup Criteria[1]	KEB-15	KEB-15	KEB-15	KEB-15
Sample Name		DUP-8-11112013	KEB-15(32-32.5)-LT	KEB-15(38-40)-LT	DUP-9-11112013
Sample Date		11/11/2013	11/11/2013	11/11/2013	11/11/2013
Sample Interval (ft)		(28-30)	(32-32.5)	(38-40)	(38-40)
VOCs (ug/Kg)					
Tetrachloroethene	100	< 60	54	72 J	**180** J
Trichloroethene	100	**350**	**350**	**400**	**660**
SPLP VOCs (ug/L)					
Tetrachloroethene	5	< 1	< 1	1.1 J	**8.2** J
Trichloroethene	5	**6.4**	**5.8**	**5.7** J	**11** J

Sample Location	Generic Cleanup Criteria[1]	KEB-15	KEB-15	KWB-9	KWB-9
Sample Name		KEB-15(48-50)-LT	KEB-15(56-58)-LT	KWB-9(6-8)-LT	KWB-9(10-12)-LT
Sample Date		11/11/2013	11/11/2013	11/5/2013	11/5/2013
Sample Interval (ft)		(48-50)	(56-58)	(6-8)	(10-12)
VOCs (ug/Kg)					
Tetrachloroethene	100	**170**	**130**	34 J	< 57
Trichloroethene	100	**450**	**350**	34	16 J
SPLP VOCs (ug/L)					
Tetrachloroethene	5	0.94 J	0.93 J	< 1	1.3
Trichloroethene	5	4.9	4.1	< 0.5	< 0.5

Sample Location	Generic Cleanup Criteria[1]	KWB-9	KWB-9	KWB-10	KWB-10
Sample Name		KWB-9(32-34)-LT	KWB-9(44-46)-LT	KWB-10(14-16)-LT	KWB-10(25-27)-LT
Sample Date		11/6/2013	11/6/2013	11/6/2013	11/6/2013
Sample Interval (ft)		(32-34)	(44-46)	(14-16)	(25-27)
VOCs (ug/Kg)					
Tetrachloroethene	100	**100**	**150**	**540**	64
Trichloroethene	100	**100**	**120**	**1500**	**280**
SPLP VOCs (ug/L)					
Tetrachloroethene	5	1.7	1.6	**7.1**	0.9 J
Trichloroethene	5	2.3	1.9	**38**	**5.5**

Notes:

[1] MDEQ Part 201 Generic Cleanup Criteria.

< Less than the laboratory reporting limit for the analyte.

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X Estimated value, some aspect of the test relative to this compound did not meet QC criteria. See batch narrative in Appendix D for explanation.

Bold exceeds soil or groundwater cleanup criteria.

Table 4-2 Comparison of Soil analytical Results in Sand To Cleanup Criteria

Sample Location	Generic Cleanup Criteria[(1)]	KWB-9	KWB-9	KWB-10	KWB-10
Sample Name		KWB-9(50-52)-LT	KWB-9(58-60)-LT	KWB-10(35-37)-LT	KWB-10(40-42)-LT
Sample Date		11/6/2013	11/6/2013	11/6/2013	11/6/2013
Sample Interval (ft)		(50-52)	(58-60)	(35-37)	(40-42)
VOCs (ug/Kg)					
Tetrachloroethene	100	**440**	**150**	**280**	67
Trichloroethene	100	**300**	**110**	**830**	**130**
SPLP VOCs (ug/L)					
Tetrachloroethene	5	3.7	1.1	4	0.69 J
Trichloroethene	5	4.4	1.3	**21**	2

Sample Location	Soil Cleanup Criteria[1]	KWB-10	KWB-12	KWB-12	KWB-12
Sample Name		KWB-10(50-52)-LT	KWB-12(20-22)-LT	KWB-12(30-32)-LT	KWB-12(40-42)-LT
Sample Date		11/6/2013	11/4/2013	11/4/2013	11/4/2013
Sample Interval (ft)		(50-52)	(20-22)	(30-32)	(40-42)
Total VOCs (ug/Kg)					
Tetrachloroethene	100	**110**	36 J	**250** J	**110**
Trichloroethene	100	**200**	**280**	**7000** J	**220**
SPLP VOCs (ug/L)					
Tetrachloroethene	5	1.1	1.1	1.4 J	1.6
Trichloroethene	5	3.5	4.7	**15** J	3.8

Sample Location	Generic Cleanup Criteria[(1)]	KWB-12	KWB-12	KWB-13	KWB-13
Sample Name		KWB-12(52-54)-LT	KWB-12(58-59)-LT	KWB-13(18-20)-LT	KWB-13(20-22)-LT
Sample Date		11/4/2013	11/4/2013	11/5/2013	11/5/2013
Sample Interval (ft)		(52-54)	(58-59)	(18-20)	(20-22)
VOCs (ug/Kg)					
Tetrachloroethene	100	**210**	**170**	< 53	< 56
Trichloroethene	100	**320**	**250**	**110**	**110**
SPLP VOCs (ug/L)					
Tetrachloroethene	5	2.6	1.9	< 1	< 1
Trichloroethene	5	**5.4**	3.9	1.3	1.7

Notes:

[(1)] MDEQ Part 201 Generic Cleanup Criteria.

< Less than the laboratory reporting limit for the analyte.

J Estimated value because compound meets the identification criteria but the result is less than the reporting limit and greater than the MDL or quality control criteria were not met.

X Estimated value, some aspect of the test relative to this compound did not meet QC criteria. See batch narrative in Appendix D for explanation.

Bold exceeds soil or groundwater cleanup criteria.

Table 4-2 Comparison of Soil analytical Results in Sand To Cleanup Criteria

Sample Location	Generic Cleanup Criteria[1]	KWB-13	KWB-13	KWB-13	KWB-13
Sample Name		DUP-2-11052013	KWB-13(38-40)-LT	DUP-3-11052013	KWB-13(48-50)-LT
Sample Date		11/5/2013	11/5/2013	11/5/2013	11/5/2013
Sample Interval (ft)		(20-22)	(38-40)	(38-40)	(48-50)
VOCs (ug/Kg)					
Tetrachloroethene	100	< 57	49 J	80	65
Trichloroethene	100	95	**180** J	**310** J	**200**
SPLP VOCs (ug/L)					
Tetrachloroethene	5	< 1	0.92 J	1.1	1.2
Trichloroethene	5	1.1	4.8	3.4	4.1

Sample Location	Generic Cleanup Criteria[1]	KWB-13
Sample Name		KWB-13(50-52)-LT
Sample Date		11/5/2013
Sample Interval (ft)		(50-52)
VOCs (ug/Kg)		
Tetrachloroethene	100	77
Trichloroethene	100	**250**
SPLP VOCs (ug/L)		
Tetrachloroethene	5	0.98 J
Trichloroethene	5	**5.1**

Notes:

[1] MDEQ Part 201 Generic Cleanup Criteria.

< Less than the laboratory reporting limit for the analyte.

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X Estimated value, some aspect of the test relative to this compound did not meet QC criteria. See batch narrative in Appendix D for explanation.

Bold exceeds soil or groundwater cleanup criteria.

Table 4-3 TCE Soil and Leachate Concentrations in Fill

Sample Location	Top Depth (feet below ground surface)	Bottom Depth (feet below ground surface)	Soil Result (ug/Kg)	Soil Result Qualifier	Leachate Result (ug/L)	Leachate Result Qualifier
KEB-101(0-2)-LT	0	2	1,100		1.7	
KEB-106(0-2)-LT	0	2	33	U	0.5	U
KEB-109(0-2)-LT	0	2	31	U	1.3	
KEB-114(0-2)-LT	0	2	410		0.5	U
KEB-115(0-2)-LT	0	2	460		0.75	
KEB-116(0-2)-LT	0	2	830		0.7	
KEB-117(0-2)-LT	0	2	24,000		120	
KEB-118(0-2)-LT	0	2	770		3.3	
KEB-124(0-2)-LT	0	2	1,100		0.5	U
KEB-126(0-2)-LT	0	2	460		0.5	U
KEB-127(0-2)-LT	0	2	3,400		0.93	
KEB-128(0-2)-LT	0	2	820	J	1.7	J
KEB-129(0-2)-LT	0	2	3,700		12	
KEB-133(0-2)-LT	0	2	1,200		2.4	
KEB-137(0-2)-LT	0	2	1,500		3.1	
KEB-139(0-2)-LT	0	2	460		0.5	U
KEB-140(0-2)-LT	0	2	47	U	0.5	U
KEB-145(0-2)-LT	0	2	1,300		2	
KEB-149(0-2)-LT	0	2	1,300		5.6	
KEB-156(0-2)-LT	0	2	1,400		3.6	
KEB-26(0-2)-LT	0	2	1,400		5.6	
KEB-62(0-2)-LT	0	2	390		0.5	U
KEB-64(0-2)-LT	0	2	2,800		17	
KEB-76(0-2)-LT	0	2	530		0.5	U
KWB-10(0-2)-LT	0	2	860		10	
KWB-10(1.9-2.5)-LT	1.9	2.5	3,500		63	
KWB-12(0-2)-LT	0	2	8,600	J	5.3	J
KWB-13(2.5-3)-LT	2.5	3	190		2.1	
KWB-13(4-6)-LT	4	6	59		1.9	
KWB-6(0-2)-LT	0	2	950		1.2	
KWB-9(0-2)-LT	0	2	280		0.5	U

Notes:

U Less than the laboratory reporting limit for the analyte.

J Estimated value because compound meets the identification criteria but the result is less than the reporting limit and greater than the MDL or quality control criteria were not met.

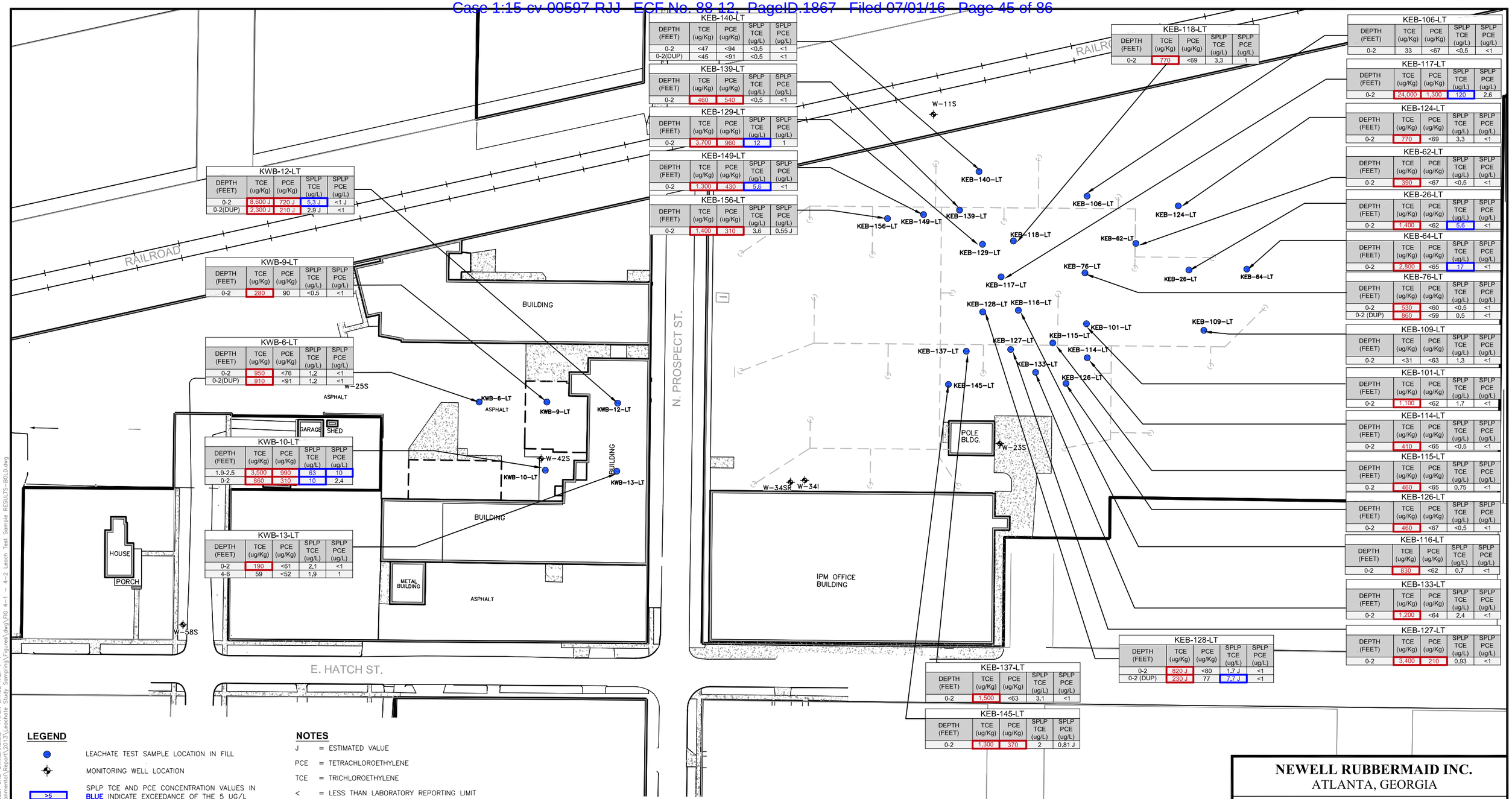
Table 4-4 TCE Soil and Leachate Concentrations in Sand

Sample Location	Top Depth (feet below ground surface)	Bottom Depth (feet below ground surface)	Soil Result (ug/Kg)	Soil Result Qualifier	Leachate Result (ug/L)	Leachate Result Qualifier
KEB-11(18-20)-LT	18	20	190		3.8	
KEB-11(28-30)-LT	28	30	450		6.3	
KEB-11(38-40)-LT	38	40	300		6.6	
KEB-11(48-50)-LT	48	50	570		9.5	
KEB-11(56-58)-LT	56	58	340		7.3	
KEB-11(8-10)-LT	8	10	130		3	
KEB-15(28-30)-LT	28	30	330		6.8	
KEB-15(32-32.5)-LT	32	32.5	350		5.8	
KEB-15(38-40)-LT	38	40	400		5.7	J
KEB-15(48-50)-LT	48	50	450		4.9	
KEB-15(56-58)-LT	56	58	350		4.1	
KEB-4 (38-40)-LT	38	40	240		4.9	
KEB-4 (48-50)-LT	48	50	380		4.4	
KEB-4 (52-54)-LT	52	54	550		7	
KEB-4 (56-58)-LT	56	58	74		2	
KEB-4(28-30)-LT	28	30	110	J	1.3	J
KEB-4(36-38)-LT	36	38	200		2.9	
KEB-5 (48-50)-LT	48	50	830		11	
KEB-5 (52-54)-LT	52	54	320		7.1	
KEB-5 (56-58)-LT	56	58	720		4.4	
KEB-7 (32-34)-LT	32	34	220		2.8	
KEB-7 (38-40)-LT	38	40	130		4.2	
KEB-7 (46-48)-LT	46	48	580		4.2	
KEB-7(48-50)-LT	48	50	410		5.7	
KEB-7(56-58)-LT	56	58	340		5.2	
KWB-10(14-16)-LT	14	16	1,500		38	
KWB-10(25-27)-LT	25	27	280		5.5	
KWB-10(35-37)-LT	35	37	830		21	
KWB-10(40-42)-LT	40	42	130		2	
KWB-10(50-52)-LT	50	52	200		3.5	
KWB-12(20-22)-LT	20	22	280		4.7	
KWB-12(30-32)-LT	30	32	7,000	J	15	J
KWB-12(40-42)-LT	40	42	220		3.8	
KWB-12(52-54)-LT	52	54	320		5.4	
KWB-12(58-59)-LT	58	59	250		3.9	
KWB-13(18-20)-LT	18	20	110		1.3	
KWB-13(20-22)-LT	20	22	110		1.7	
KWB-13(38-40)-LT	38	40	180	J	4.8	
KWB-13(48-50)-LT	48	50	200		4.1	
KWB-13(50-52)-LT	50	52	250		5.1	
KWB-9(10-12)-LT	10	12	16	J	0.5	U
KWB-9(32-34)-LT	32	34	100		2.3	
KWB-9(44-46)-LT	44	46	120		1.9	
KWB-9(50-52)-LT	50	52	300		4.4	
KWB-9(58-60)-LT	58	60	110		1.3	
KWB-9(6-8)-LT	6	8	34		0.5	U

Notes:

U Less than the laboratory reporting limit for the analyte.

J Estimated value because compound meets the identification criteria but the result is less than the reporting limit and greater than the MDL or quality control criteria were not met.



KWB-12-LT

DEPTH (FEET)	TCE (ug/Kg)	PCE (ug/Kg)	SPLP TCE (ug/L)	SPLP PCE (ug/L)
0-2	8,600 J	720 J	5.3 J	<1 J
0-2(DUP)	2,300 J	210 J	2.9 J	<1

KWB-9-LT

DEPTH (FEET)	TCE (ug/Kg)	PCE (ug/Kg)	SPLP TCE (ug/L)	SPLP PCE (ug/L)
0-2	280	90	<0.5	<1

KWB-6-LT

DEPTH (FEET)	TCE (ug/Kg)	PCE (ug/Kg)	SPLP TCE (ug/L)	SPLP PCE (ug/L)
0-2	950	<76	1.2	<1
0-2(DUP)	910	<91	1.2	<1

KWB-10-LT

DEPTH (FEET)	TCE (ug/Kg)	PCE (ug/Kg)	SPLP TCE (ug/L)	SPLP PCE (ug/L)
1.9-2.5	3,500	990	63	10
0-2	860	310	10	2.4

KWB-13-LT

DEPTH (FEET)	TCE (ug/Kg)	PCE (ug/Kg)	SPLP TCE (ug/L)	SPLP PCE (ug/L)
0-2	190	<61	2.1	<1
4-6	59	<52	1.9	1

KEB-140-LT

DEPTH (FEET)	TCE (ug/Kg)	PCE (ug/Kg)	SPLP TCE (ug/L)	SPLP PCE (ug/L)
0-2	<47	<94	<0.5	<1
0-2(DUP)	<45	<91	<0.5	<1

KEB-139-LT

DEPTH (FEET)	TCE (ug/Kg)	PCE (ug/Kg)	SPLP TCE (ug/L)	SPLP PCE (ug/L)
0-2	460	540	<0.5	<1

KEB-129-LT

DEPTH (FEET)	TCE (ug/Kg)	PCE (ug/Kg)	SPLP TCE (ug/L)	SPLP PCE (ug/L)
0-2	3,700	960	12	1

KEB-149-LT

DEPTH (FEET)	TCE (ug/Kg)	PCE (ug/Kg)	SPLP TCE (ug/L)	SPLP PCE (ug/L)
0-2	1,300	430	5.6	<1

KEB-156-LT

DEPTH (FEET)	TCE (ug/Kg)	PCE (ug/Kg)	SPLP TCE (ug/L)	SPLP PCE (ug/L)
0-2	1,400	310	3.6	0.55 J

KEB-118-LT

DEPTH (FEET)	TCE (ug/Kg)	PCE (ug/Kg)	SPLP TCE (ug/L)	SPLP PCE (ug/L)
0-2	770	<69	3.3	1

KEB-106-LT

DEPTH (FEET)	TCE (ug/Kg)	PCE (ug/Kg)	SPLP TCE (ug/L)	SPLP PCE (ug/L)
0-2	33	<67	<0.5	<1

KEB-117-LT

DEPTH (FEET)	TCE (ug/Kg)	PCE (ug/Kg)	SPLP TCE (ug/L)	SPLP PCE (ug/L)
0-2	24,000	1,300	120	2.6

KEB-124-LT

DEPTH (FEET)	TCE (ug/Kg)	PCE (ug/Kg)	SPLP TCE (ug/L)	SPLP PCE (ug/L)
0-2	770	<69	3.3	<1

KEB-62-LT

DEPTH (FEET)	TCE (ug/Kg)	PCE (ug/Kg)	SPLP TCE (ug/L)	SPLP PCE (ug/L)
0-2	390	<67	<0.5	<1

KEB-26-LT

DEPTH (FEET)	TCE (ug/Kg)	PCE (ug/Kg)	SPLP TCE (ug/L)	SPLP PCE (ug/L)
0-2	1,400	<62	5.6	<1

KEB-64-LT

DEPTH (FEET)	TCE (ug/Kg)	PCE (ug/Kg)	SPLP TCE (ug/L)	SPLP PCE (ug/L)
0-2	2,800	<65	17	<1

KEB-76-LT

DEPTH (FEET)	TCE (ug/Kg)	PCE (ug/Kg)	SPLP TCE (ug/L)	SPLP PCE (ug/L)
0-2	530	<60	<0.5	<1
0-2 (DUP)	860	<59	0.5	<1

KEB-109-LT

DEPTH (FEET)	TCE (ug/Kg)	PCE (ug/Kg)	SPLP TCE (ug/L)	SPLP PCE (ug/L)
0-2	<31	<63	1.3	<1

KEB-101-LT

DEPTH (FEET)	TCE (ug/Kg)	PCE (ug/Kg)	SPLP TCE (ug/L)	SPLP PCE (ug/L)
0-2	1,100	<62	1.7	<1

KEB-114-LT

DEPTH (FEET)	TCE (ug/Kg)	PCE (ug/Kg)	SPLP TCE (ug/L)	SPLP PCE (ug/L)
0-2	410	<65	<0.5	<1

KEB-115-LT

DEPTH (FEET)	TCE (ug/Kg)	PCE (ug/Kg)	SPLP TCE (ug/L)	SPLP PCE (ug/L)
0-2	460	<65	0.75	<1

KEB-126-LT

DEPTH (FEET)	TCE (ug/Kg)	PCE (ug/Kg)	SPLP TCE (ug/L)	SPLP PCE (ug/L)
0-2	460	<67	<0.5	<1

KEB-116-LT

DEPTH (FEET)	TCE (ug/Kg)	PCE (ug/Kg)	SPLP TCE (ug/L)	SPLP PCE (ug/L)
0-2	830	<62	0.7	<1

KEB-133-LT

DEPTH (FEET)	TCE (ug/Kg)	PCE (ug/Kg)	SPLP TCE (ug/L)	SPLP PCE (ug/L)
0-2	1,200	<64	2.4	<1

KEB-127-LT

DEPTH (FEET)	TCE (ug/Kg)	PCE (ug/Kg)	SPLP TCE (ug/L)	SPLP PCE (ug/L)
0-2	3,400	210	0.93	<1

KEB-128-LT

DEPTH (FEET)	TCE (ug/Kg)	PCE (ug/Kg)	SPLP TCE (ug/L)	SPLP PCE (ug/L)
0-2	820 J	<80	1.7 J	<1
0-2 (DUP)	230 J	77	7.7 J	<1

KEB-137-LT

DEPTH (FEET)	TCE (ug/Kg)	PCE (ug/Kg)	SPLP TCE (ug/L)	SPLP PCE (ug/L)
0-2	1,500	<63	3.1	<1

KEB-145-LT

DEPTH (FEET)	TCE (ug/Kg)	PCE (ug/Kg)	SPLP TCE (ug/L)	SPLP PCE (ug/L)
0-2	1,300	370	2	0.81 J

LEGEND

- LEACHATE TEST SAMPLE LOCATION IN FILL
- MONITORING WELL LOCATION
- >5 — SPLP TCE AND PCE CONCENTRATION VALUES IN **BLUE** INDICATE EXCEEDANCE OF THE 5 UG/L GROUNDWATER CLEANUP CRITERIA
- >100 — TCE AND PCE CONCENTRATION VALUES IN **RED** INDICATE EXCEEDANCE OF THE 100 UG/KG SOIL CLEANUP CRITERIA
- EXISTING SVE WELL AND MANIFOLD
- RAILROAD TRACK
- PROPERTY BOUNDARY
- EXISTING BUILDING
- FORMER BUILDING
- CONCRETE

NOTES

J = ESTIMATED VALUE
PCE = TETRACHLOROETHYLENE
TCE = TRICHLOROETHYLENE
< = LESS THAN LABORATORY REPORTING LIMIT

REFERENCE: MOSTROM & ASSOC., INC., SURVEY NO. ST1-22960, 6/27/2012

NORTH

0 40 80 160

SCALE IN FEET

NEWELL RUBBERMAID INC.
ATLANTA, GEORGIA

FIGURE 4-1
COMPARISON OF SOIL ANALYTICAL RESULTS IN FILL TO CLEANUP CRITERIA
STURGIS MUNICIPAL WELL FIELD
SUPERFUND SITE STURGIS, MICHIGAN

DATE: January 15, 2014
JOB NO.: 25366459.00511
DRAWN BY: LLM
CHK'D BY: RR
SCALE: AS SHOWN

URS
100 SOUTH WACKER DRIVE, SUITE 500
CHICAGO, ILLINOIS 60606
PHONE: (312) 939-1000
FAX: (312) 939-4198

RAILROAD

RAILROAD

W-11S

N. PROSPECT ST.

BUILDING

W-25S

ASPHALT

ASPHALT

KWB-9-LT

KWB-12-LT

GARAGE

SHED

PORCH

HOUSE

W-42S

KWB-10-LT

KWB-13-LT

BUILDING

BUILDING

HOUSE

PORCH

METAL BUILDING

ASPHALT

W-58S

E. HATCH ST.

KEB-7-LT

KEB-15-LT

KEB-4-LT

KEB-11-LT

POLE BLDG.

W-28S

KEB-5-LT

W-34SR

W-34I

IPM OFFICE BUILDING

KWB-12-LT

DEPTH (FEET)	TCE (ug/Kg)	PCE (ug/Kg)	SPLP TCE (ug/L)	SPLP PCE (ug/L)
20-22	280	36 J	4.7	1.1
30-32	7,000 J	250 J	15 J	1.4 J
40-42	220	110	3.8	1.6
52-54	320	210	5.4	2.6
58-59	250	170	3.9	1.9

KWB-9-LT

DEPTH (FEET)	TCE (ug/Kg)	PCE (ug/Kg)	SPLP TCE (ug/L)	SPLP PCE (ug/L)
6-8	34	34 J	0.5	1
10-12	16 J	<57	<0.5	1.3
32-34	100	100	2.3	1.7
44-46	120	150	1.9	1.6
50-52	300	440	4.4	3.7
58-60	110	150	1.3	1.1

KWB-10-LT

DEPTH (FEET)	TCE (ug/Kg)	PCE (ug/Kg)	SPLP TCE (ug/L)	SPLP PCE (ug/L)
14-16	1,500	540	38	7.1
25-27	280	64	5.5	0.9 J
35-37	830	280	21	4
40-42	130	67	2	0.69 J
50-52	200	110	3.5	1.1

KWB-13-LT

DEPTH (FEET)	TCE (ug/Kg)	PCE (ug/Kg)	SPLP TCE (ug/L)	SPLP PCE (ug/L)
18-20	110	<53	1.3	<1
20-22	110	<56	1.7	<1
20-22(DUP)	95	<57	1.1	<1
38-40	180 J	49 J	4.8	0.92
38-40(DUP)	310 J	80	3.4	1.1
48-50	200	65	4.1	1.2
50-52	250	77	5.1	0.98 J

KEB-4-LT

DEPTH (FEET)	TCE (ug/Kg)	PCE (ug/Kg)	SPLP TCE (ug/L)	SPLP PCE (ug/L)
28-30	110 J	<65	1.3 J	<1
28-30(DUP)	230 J	<51	2.9 J	1
36-38	200	42 J	2.9	1
38-40	240	57	4.9	0.85 J
48-50	380	120	4.4	1.1
52-54	550	190	7	1.6
56-58	74	<58	2	<1

KEB-5-LT

DEPTH (FEET)	TCE (ug/Kg)	PCE (ug/Kg)	SPLP TCE (ug/L)	SPLP PCE (ug/L)
48-50	830	170	11	1.2
48-50(DUP)	1,100	220	14	1.5
52-54	320	65	7.1	0.91 J
56-58	720	160	4.4	5.1

KEB-7-LT

DEPTH (FEET)	TCE (ug/Kg)	PCE (ug/Kg)	SPLP TCE (ug/L)	SPLP PCE (ug/L)
32-34	220	27 J	2.8	<1
38-40	130	<59	4.2	<1
46-48	580	110	4.2	<1
48-50	410	79	5.7	<1
56-58	340	74	5.2	<1

KEB-15-LT

DEPTH (FEET)	TCE (ug/Kg)	PCE (ug/Kg)	SPLP TCE (ug/L)	SPLP PCE (ug/L)
28-30	330	<55	6.8	<1
28-30(DUP)	350	<60	6.4	<1
32-32.5	350	54	5.8	<1
38-40	400	72 J	5.7 J	1.1 J
38-40(DUP)	660	180 J	11 J	8.2 J
48-50	450	170	4.9	0.94 J
56-58	350	130	4.1	0.93 J

KEB-11-LT

DEPTH (FEET)	TCE (ug/Kg)	PCE (ug/Kg)	SPLP TCE (ug/L)	SPLP PCE (ug/L)
8-10	130	<51	3	<1
8-10 (DUP)	88	<55	1.9	<1
18-20	190	<54	3.8	<1
28-30	450	120	6.3	1
38-40	300	110	6.6	1.8
48-50	570	260	9.5	3.1
56-58	340	180	7.3	2.6

LEGEND

- LEACHATE TEST SAMPLE LOCATION IN SAND
- MONITORING WELL LOCATION
- >5 — SPLP TCE AND PCE CONCENTRATION VALUES IN **BLUE** INDICATE EXCEEDANCE OF THE 5 UG/L GROUNDWATER CLEANUP CRITERIA
- >100 — TCE AND PCE CONCENTRATION VALUES IN **RED** INDICATE EXCEEDANCE OF THE 100 UG/KG SOIL CLEANUP CRITERIA
- EXISTING SVE WELL AND MANIFOLD
- RAILROAD TRACK
- PROPERTY BOUNDARY
- EXISTING BUILDING
- FORMER BUILDING
- CONCRETE

NOTES

J = ESTIMATED VALUE

PCE = TETRACHLOROETHYLENE

TCE = TRICHLOROETHYLENE

< = LESS THAN LABORATORY REPORTING LIMIT

REFERENCE: MOSTROM & ASSOC., INC., SURVEY NO. ST1-22960, 6/27/2012

NORTH

0 40 80 160

SCALE IN FEET

NEWELL RUBBERMAID INC.
ATLANTA, GEORGIA

FIGURE 4-2
COMPARISON OF SOIL ANALYTICAL RESULTS IN SAND TO CLEANUP CRITERIA
STURGIS MUNICIPAL WELL FIELD
SUPERFUND SITE STURGIS, MICHIGAN

DATE: January 15, 2014
JOB NO.: 25366459.00511
DRAWN BY: LLM
CHK'D BY: RR
SCALE: AS SHOWN

URS
100 SOUTH WACKER DRIVE, SUITE 500
CHICAGO, ILLINOIS 60606
PHONE: (312) 939-1000
FAX: (312) 939-4198

5.0 SUMMARY

A soil leach testing was conducted at the Kirsch source area between November 4 and 13, 2013. A total of 34 soil borings were advanced in the vadose zone, including five borings in the west parcel and 29 soil borings in the east parcel. Thirty-one soil samples and five duplicates were collected within fill material for TCE and PCE analysis, and 31 soil samples and five duplicates were collected for SPLP TCE and PCE analysis. Seven samples were also collected within the fill material for particle size and particle distribution analysis. Forty-six soil samples and seven duplicates were collected within the sandy soil for TCE and PCE analysis, and 46 soil samples and seven duplicates were collected for SPLP TCE and PCE analysis. Ten samples were also collected within the sandy soil for particle size and particle distribution analysis. The following sections summarize the results of the soil leach testing.

5.1 Soil Physical Results

5.1.1 Fill

Based on the physical testing, the fill material consists primarily of sand and minor amounts of silt, gravel, and clay. On an average, the fill material consists of approximately 14% gravel, 57% sand, 16% silt, and 13% clay.

5.1.2 Sand

Based on the physical testing, the sandy soil consists primarily of sand and minor amounts of gravel and traces of silt and clay. On an average, the sandy soil consists of approximately 16% gravel, 77% sand, 5% silt, and 2% clay.

5.2 Soil Analytical Results

5.2.1 Fill

Soil TCE concentrations exceeded the soil cleanup criterion in 31 of the 36 samples (including five duplicates) collected in the fill material. Leachate TCE concentrations exceeded the groundwater cleanup criterion in nine of the 36 samples (including five duplicates). Similarly, soil PCE concentrations exceeded the soil cleanup criterion in 11 of the 36 samples (including five duplicates) collected in the fill material. Leachate PCE concentrations exceeded the groundwater cleanup criterion in only one of the 36 samples (including five duplicates).

5.2.2 Sand

Soil TCE concentrations exceeded the soil cleanup criterion in 47 of the 53 samples (including seven duplicates) collected in the sandy soil. Leachate TCE concentrations exceeded the groundwater cleanup criterion in 21 of the 53 samples (including seven duplicates). Similarly, soil PCE concentrations exceeded the soil cleanup criterion in 23 of the 53 samples (including seven duplicates) collected in the sandy soil. Leachate PCE

concentrations exceeded the groundwater cleanup criterion in three of the 53 samples (including seven duplicates).

5.3 Statistical Analysis Results and New Soil Cleanup Criteria

A statistical analysis was performed to determine the relationship between the soil and leachate TCE and PCE concentrations in the fill material and sandy soil. A new soil cleanup criterion was calculated only if the data exhibited a strong statistical relationship. For PCE, a relationship between the soil and leachate concentrations was not observed for either the fill material or the sandy soil. Therefore, the cleanup criterion for PCE in both soil types will default to the generic soil cleanup criterion of 100 ug/Kg for protection of groundwater.

For TCE, it was determined that the relationship between the soil and leachate concentrations for both types of soil (fill and sand) was statistically significant. Therefore, new soil cleanup criteria were derived for TCE in both soil types using an appropriate statistical method for each data set.

5.3.1 TCE in Fill

The ATS regression method was used to statistically relate the TCE soil and leachate concentrations in the fill material. The soil TCE concentration corresponding to the generic groundwater cleanup criterion of 5 ug/L, calculated directly from the one-sided 5% LCL of the slope estimate of the ATS regression, was determined to be 566 ug/Kg. Therefore, the proposed new soil cleanup criterion for TCE in the fill material is 566 ug/Kg.

5.3.2 TCE in Sand

The GLM regression method was used to statistically relate the TCE soil and leachate concentrations in the sandy soil. The soil TCE concentration corresponding to the generic groundwater cleanup criterion of 5 ug/L, calculated directly from the one-sided 5% LCL of the slope estimate of the GLM regression, was determined to be 304 ug/kg. Therefore, the proposed new soil cleanup criterion for TCE in the sandy soil is 304 ug/Kg.

6.0 REFERENCES

ASTM International, 2007. ASTM (formerly known as the American Society for Testing and Materials [ASTM], ASTM Standard Method D422 - 63(2007) "Standard Test Method for Particle-Size Analysis of Soils," ASTM International, West Conshohocken, Pennsylvania, 2007, DOI: 10.1520/D0422-63R07, www.astm.org.

Helsel, Dennis R. 2012. Statistics for Censored Environmental Data Using Minitab® and R. Second Edition. John Wiley & Sons, Inc., Hoboken, New Jersey.

Michigan Department of Environmental Quality (MDEQ), 2004a. Remediation and Redevelopment Division (RRD) Operational Memorandum No. 2: Sampling and Analysis – Attachment 2 Soil Leaching Methods, October 22.

Michigan Department of Environmental Quality (MDEQ), 2004b. Remediation and Redevelopment Division (RRD) Operational Memorandum No. 1: Part 201 Cleanup Criteria and Part 213 Risk-based Screening Levels, December 10.

Michigan Department of Environmental Quality (MDEQ), 2013. Letter from Carrie L. Geyer of MDEQ to Kristin Jones of Newell Rubbermaid Subject: Revised Plan for Soil Leach Testing in Former Kirsch Plant No. 1 Source Area, May 8.

Michigan Department of Environmental Quality (MDEQ), 2014a. Email from Robert L. Franks of MDEQ to Kristin Jones of Newell Rubbermaid Subject: MDEQ Comments - Sturgis Wellfield Leach Testing Report, May 7.

Michigan Department of Environmental Quality (MDEQ), 2014b. Email from Robert L. Franks of MDEQ to David Meiri of URS Subject: Sturgis Meeting Summary, August 4.

Sigma Statistical Consulting (SSC), 2015a. Revised Leach Testing Report, Former Kirsch Plant No.1 Source Area, Sturgis Municipal Well Field Superfund Site, Sturgis, Michigan, April 14.

Sigma Statistical Consulting (SSC), 2015b. Email from Sarah Hession of SSC to Chi-Wah Wong of URS Subject: Re: Sturgis Statistical Results, September 24.

United States Environmental Protection Agency (USEPA), 2008. Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW-846, Update IV of the Third Edition, January 3.

URS Corporation (URS), 2013. Revised Work Plan for Soil Leach Testing in the Former Kirsch Plant No. 1 Source Area, Sturgis Municipal Well Field Superfund Site, Michigan, April 29.

URS Corporation (URS), 2014a. Leach Testing Report, Former Kirsch Plant No.1 Source Area, Sturgis Municipal Well Field Superfund Site, Sturgis, Michigan, January 24.

URS Corporation (URS), 2014b. Response to MDEQ Comments on Leach Testing Report, Former Kirsch Plant No.1 Source Area, Sturgis Municipal Well Field Superfund Site, Sturgis, Michigan, June 9.

URS Corporation (URS), 2014c. Summary of June 20, 2014 Meeting with MDEQ Regarding Leach Testing Report, July 8.

URS Corporation (URS), 2014d. Revised Leach Testing Report, Former Kirsch Plant No.1 Source Area, Sturgis Municipal Well Field Superfund Site, Sturgis, Michigan, September 9.

URS Corporation (URS), 2015. Response to Comments Provided by Sigma Statistical Consulting on Revised Leach Testing Report, Sturgis Municipal Well Field Superfund Site, Sturgis, Michigan, June 4.

Appendix A

Photo Logs

Leach Testing November 2013
Sturgis Municipal Well Field Superfund Site
Sturgis, Michigan

PHOTOGRAPH 1.:
KWB-12 (0-2)

PHOTOGRAPH 2.:
KWB-12 (20-22)

PHOTOGRAPH 3.:
KWB-12 (30-32)

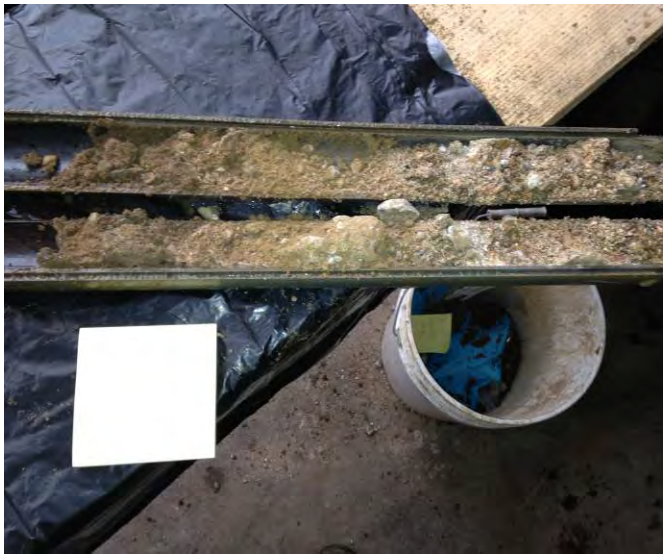
Leach Testing November 2013
Sturgis Municipal Well Field Superfund Site
Sturgis, Michigan

PHOTOGRAPH 4.:
KWB-12 (40-42)

PHOTOGRAPH 5.:
KWB-12 (52-54)

PHOTOGRAPH 6.:
KWB-13 (2-4) spoon
Sampled KWB-13 (2.5-3)

PHOTOGRAPH 7.:
KWB-13 (4-6)



PHOTOGRAPH 8.:
KWB-13 (16-18)

PHOTOGRAPH 9.:
KWB-13 (20-22)

PHOTOGRAPH 10.:
KWB-13 (38-40)

PHOTOGRAPH 11.:
KWB-13 (48-50)

PHOTOGRAPH 12.:
KWB-13 (50-52)

PHOTOGRAPH 13.:
KWB-6 (0-2)

PHOTOGRAPH 14.:
KWB-9 (0-2)

PHOTOGRAPH 15.:
KWB-9 (6-8)

PHOTOGRAPH 16.:
KWB-9 (10-12)

PHOTOGRAPH 17.:
KWB-9 (32-34)

PHOTOGRAPH 18.:
KWB-9 (44-46)

Leach Testing November 2013
Sturgis Municipal Well Field Superfund Site
Sturgis, Michigan

PHOTOGRAPH 19.:
KWB-9 (50-52)

PHOTOGRAPH 20.:
KWB-9 (58-60)

PHOTOGRAPH 21.:
KWB-10 (0-2)

PHOTOGRAPH 22.:
KWB-10 (2-4) spoon.
Sample KWB-10 (1.9-2.5) taken from 1.9-2.5 feet.

PHOTOGRAPH 23.:
KWB-10 (14-16)

PHOTOGRAPH 24.:
KWB-10 (25-27)

Leach Testing November 2013
Sturgis Municipal Well Field Superfund Site
Sturgis, Michigan

PHOTOGRAPH 25.:
KWB-10 (35-37)

PHOTOGRAPH 26.:
KWB-10 (40-42)

PHOTOGRAPH 27.:
KWB-10 (50-52)

PHOTOGRAPH 28.:
KEB-4 (28-30)

PHOTOGRAPH 29.:
KEB-4 (36-38)

PHOTOGRAPH 30.:
KEB-4 (38-40)

PHOTOGRAPH 31.:
KEB-4 (48-50)

PHOTOGRAPH 32.:
KWB-4 (52-54)

PHOTOGRAPH 33.:
KEB-4 (56-58)

PHOTOGRAPH 34.:
KEB-5 (48-50)

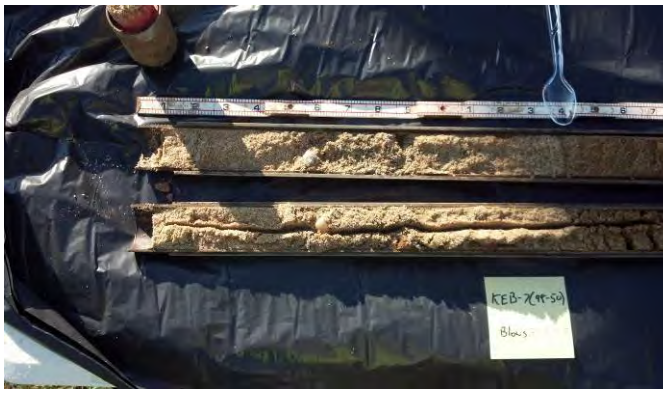
PHOTOGRAPH 35.:
KEB-5 (52-54)

PHOTOGRAPH 36.:
KEB-5 (56-58)

PHOTOGRAPH 37.:
KEB-7 (32-34)

PHOTOGRAPH 38.:
KEB-7 (38-40)

PHOTOGRAPH 39.:
KEB-7 (46-48)



PHOTOGRAPH 40.:
KEB-7 (48-50)

PHOTOGRAPH 41.:
KEB-7 (56-58)

PHOTOGRAPH 42.:
KEB-11 (8-10)

Leach Testing November 2013
Sturgis Municipal Well Field Superfund Site
Sturgis, Michigan

URS

PHOTOGRAPH 43.:
KEB-11 (18-20)

PHOTOGRAPH 44.:
KEB-11 (28-30)

PHOTOGRAPH 45.:
KEB-11 (38-40)

Leach Testing November 2013
Sturgis Municipal Well Field Superfund Site
Sturgis, Michigan

PHOTOGRAPH 46.:
KEB-11 (48-50)

PHOTOGRAPH 47.:
KEB-11 (56-58)

PHOTOGRAPH 48.:
KEB-15 (28-30)

PHOTOGRAPH 49.:
KEB-15 (32-34)
Sampled KEB-15 (32-32.5)

PHOTOGRAPH 50.:
KEB-15 (38-40)

PHOTOGRAPH 51.:
KEB-15 (48-50)

Leach Testing November 2013
Sturgis Municipal Well Field Superfund Site
Sturgis, Michigan

PHOTOGRAPH 52.:
KEB-15 (56-58)

PHOTOGRAPH 53.:
KEB-26 (0-2)

PHOTOGRAPH 54.:
KEB-62 (0-2)

Leach Testing November 2013
Sturgis Municipal Well Field Superfund Site
Sturgis, Michigan

PHOTOGRAPH 55.:
KEB-64 (0-2)

PHOTOGRAPH 56.:
KEB-76 (0-2)

PHOTOGRAPH 57.:
KEB-101 (0-2)

PHOTOGRAPH 58.:
KEB-106 (0-2)

PHOTOGRAPH 59.:
KEB-109 (0-2)

PHOTOGRAPH 60.:
KEB-114 (0-2)

Leach Testing November 2013
Sturgis Municipal Well Field Superfund Site
Sturgis, Michigan

PHOTOGRAPH 61.:
KEB-115 (0-2)

PHOTOGRAPH 62.:
KEB-117 (0-2)

PHOTOGRAPH 63.:
KEB-118 (0-2)

PHOTOGRAPH 64.:
KEB-124 (0-2)

PHOTOGRAPH 65.:
KEB-126 (0-2)

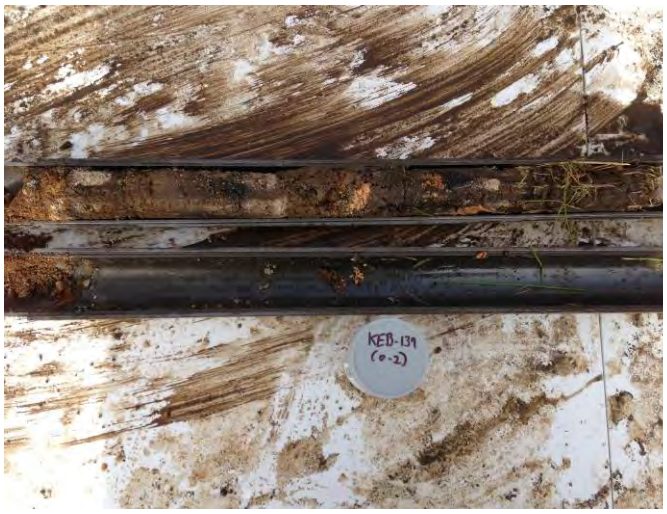
PHOTOGRAPH 66.:
KEB-128 (0-2)

PHOTOGRAPH 67.:
KEB-129 (0-2)

PHOTOGRAPH 68.:
KEB-133 (0-2)

PHOTOGRAPH 69.:
KEB-137 (0-2)

Leach Testing November 2013
Sturgis Municipal Well Field Superfund Site
Sturgis, Michigan



PHOTOGRAPH 70.:
KEB-139 (0-2)

PHOTOGRAPH 71.:
KEB-140 (0-2)

PHOTOGRAPH 72.:
KEB-145 (0-2)

Leach Testing November 2013
Sturgis Municipal Well Field Superfund Site
Sturgis, Michigan

PHOTOGRAPH 73.:
KEB-149 (0-2)

PHOTOGRAPH 74.:
KEB-156 (0-2)

Note: Pictures of KWB-12 (58-59), KEB-16 (0-2), and KEB-127 (0-2) are not presented.

Appendix B

Soil Waste Manifest

WASTE MANAGEMENT

NON-HAZARDOUS MANIFEST

NON-HAZARDOUS MANIFEST	1. Generator's US EPA ID No. MID005069430 Manifest Doc No.	2. Page 1 of

3. Generator's Mailing Address:	Generator's Site Address (If different than mailing):	A. Manifest Number
KIRSCH WELL FIELD PROJECT 622 SPRING MEADOW FARM DRIVE MIDDLEBURY, IN 46540	KIRSCH WELL FIELD PROJECT 309 N PROSPECT ST ST. LOUIS, MI COUNTY:	WMNA 00862148
4. Generator's Phone		B. State Generator's ID

5. Transporter 1 Company Name	6. US EPA ID Number	C. State Transporter's ID
TERRA CONTRACTING, LLC	MIK768689127	D. Transporter's Phone
7. Transporter 2 Company Name	8. US EPA ID Number	E. State Transporter's ID
		F. Transporter's Phone
9. Designated Facility Name and Site Address	10. US EPA ID Number	G. State Facility ID
WESTSIDE LANDFILL 14094 M-60 WEST THREE RIVERS, MI 49093	MID985634583	H. State Facility Phone

GENERATOR

11. Description of Waste Materials	12. Containers No.	12. Containers Type	13. Total Quantity	14. Unit Wt./Vol.	I. Misc. Comments
a. Waste Name: CONTAMINATED SOIL & MISCELLANEOUS DEBR WM Profile #		CM	20	Y	111191MI
b. 111191MI WM Profile #					
c. WM Profile #					
d. WM Profile #					

J. Additional Descriptions for Materials Listed Above	K. Disposal Location			
TC Job 20623, PO 222185	Cell		Level	
	Grid			

15. Special Handling Instructions and Additional Information

Purchase Order # EMERGENCY CONTACT / PHONE NO.:

16. GENERATOR'S CERTIFICATE:

I hereby certify that the above-described materials are not hazardous wastes as defined by CFR Part 261 or any applicable state law, have been fully and accurately described, classified and packaged and are in proper condition for transportation according to applicable regulations.

Printed Name	Signature "On behalf of"	Month	Day	Year
MIKE T. MILLER		12	17	13

TRANSPORTER

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed Name	Signature	Month	Day	Year
Cory Fritz		12	17	13

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed Name	Signature	Month	Day	Year

FACILITY

19. Certificate of Final Treatment/Disposal

I certify, on behalf of the above listed treatment facility, that to the best of my knowledge, the above-described waste was managed in compliance with all applicable laws, regulations, permits and licenses on the dates listed above.

20. Facility Owner or Operator: Certification of receipt of non-hazardous materials covered by this manifest.

Printed Name	Signature	Month	Day	Year
[illegible] House		12	17	13

White- TREATMENT, STORAGE, DISPOSAL FACILITY COPY Blue- GENERATOR #2 COPY Yellow- GENERATOR #1 COPY

Pink- FACILITY USE ONLY Gold- TRANSPORTER #1 COPY

WASTE MANAGEMENT

9150647

Original

Westside Landfill
14094 M-60 West
Three Rivers, MI, 49093
Ph: (269)279-5444

Ticket# 308596

Customer Name TERRACONTRA TERRA CONTRACTING Carrier TER TERRA CONTRACTING
Ticket Date 12/17/2013 Vehicle# 16920 Volume 20.0

Payment Type Credit Account
Manual Ticket#
Hauling Ticket#
Route
State Waste Code
Manifest 00862148
Destination
PO P227271
Profile 111191MI (NON HAZARDOUS SOIL)
Generator 129-KIRSCHWI KIRSCH WI FIELD PROJECT

Container
Driver
Check#
Billing # 0001478
Gen EPA ID

	Time	Scale	Operator
In	12/17/2013 10:03:51	SCALE	lhouse
Out	12/17/2013 10:50:43	SCALE	lhouse

* Manual Weight

Gross	45220 lb
Tare	37680 lb*
Net	7540 lb
Tons	3.77

Comments CONT SOIL

	Product	LD%	Qty	UOM	Rate	Fee	Amount	Origin
1	Cont Soil Sp. W.-T	100	3.77	Tons				MI-OTTAWA
2	FUEL-Fuel Surcharg	100		%				MI-OTTAWA
3	EVF-L-Standard Env	100	1	Load				MI-OTTAWA
4	561T-SB 561 STATE	100	3.77	Tons				MI-OTTAWA

Cory Fritz
12-17-13

Total Fees
Total Ticket

403WM-N

Appendix C

Laboratory Analytical Reports

(On Cd)

Appendix D

Data Validation Reports

(On Cd)

Appendix E

Statistical Evaluation Output Sheets

Statistical Output for Akritas-Theil-Sen (ATS) Non-Parametric Regression Technique for TCE in Fill Material

Input Parameters

Sample Location	Top Depth (feet below ground surface)	Bottom Depth (feet below ground surface)	Soil Result (ug/Kg)	Soil Result Qualifier	Leachate Result (ug/L)	Leachate Result Qualifier
KEB-101(0-2)-LT	0	2	1,100		1.7	
KEB-106(0-2)-LT	0	2	33	U	0.5	U
KEB-109(0-2)-LT	0	2	31	U	1.3	
KEB-114(0-2)-LT	0	2	410		0.5	U
KEB-115(0-2)-LT	0	2	460		0.75	
KEB-116(0-2)-LT	0	2	830		0.7	
KEB-117(0-2)-LT	0	2	24,000		120	
KEB-118(0-2)-LT	0	2	770		3.3	
KEB-124(0-2)-LT	0	2	1,100		0.5	U
KEB-126(0-2)-LT	0	2	460		0.5	U
KEB-127(0-2)-LT	0	2	3,400		0.93	
KEB-128(0-2)-LT	0	2	820	J	1.7	J
KEB-129(0-2)-LT	0	2	3,700		12	
KEB-133(0-2)-LT	0	2	1,200		2.4	
KEB-137(0-2)-LT	0	2	1,500		3.1	
KEB-139(0-2)-LT	0	2	460		0.5	U
KEB-140(0-2)-LT	0	2	47	U	0.5	U
KEB-145(0-2)-LT	0	2	1,300		2	
KEB-149(0-2)-LT	0	2	1,300		5.6	
KEB-156(0-2)-LT	0	2	1,400		3.6	
KEB-26(0-2)-LT	0	2	1,400		5.6	
KEB-62(0-2)-LT	0	2	390		0.5	U
KEB-64(0-2)-LT	0	2	2,800		17	
KEB-76(0-2)-LT	0	2	530		0.5	U
KWB-10(0-2)-LT	0	2	860		10	
KWB-10(1.9-2.5)-LT	1.9	2.5	3,500		63	
KWB-12(0-2)-LT	0	2	8,600	J	5.3	J
KWB-13(2.5-3)-LT	2.5	3	190		2.1	
KWB-13(4-6)-LT	4	6	59		1.9	
KWB-6(0-2)-LT	0	2	950		1.2	
KWB-9(0-2)-LT	0	2	280		0.5	U

Notes:

U Less than the laboratory reporting limit for the analyte.

J Estimated value because compound meets the identification criteria but the result is less than the reporting limit and greater than the MDL or quality control criteria were not met.

Code and Output

```
> with(data, cenken(SoilConc, SoilCen, LeachateConc, LeachateCen))
slope
[1] 196.5517

intercept
[1] 413.7931

tau
[1] 0.5247312

p
[1] 2.544383e-05

# R code for bootstrap simulation of confidence intervals of the slope, received from Sarah Hession of SSC on 8/18/2015
# Set 2-sided confidence interval to 90%, which returns 1-sided 5% lower confidence limit.

> boot.ci(bs.cenkenslope,conf=0.90,type='all')
BOOTSTRAP CONFIDENCE INTERVAL CALCULATIONS
Based on 10000 bootstrap replicates
CALL :
boot.ci(boot.out = bs.cenkenslope, conf = 0.9, type = "all")
Intervals :
Level Normal Basic
90% ( 93.1, 286.3 ) ( 93.1, 274.3 )
Level Percentile BCa
90% (118.8, 300.0 ) (113.2, 297.4 )
Calculations and Intervals on Original Scale
Warning message:
In boot.ci(bs.cenkenslope, conf = 0.9, type = "all") :
bootstrap variances needed for studentized intervals
```

Soil (ug/kg) = 196.5517 * Leachate (ug/L) + 413.7931

Leachate = 5 ug/L
Soil = 113.2 * 5 = 566 ug/kg (without intercept)

Statistical Output for Generalized Linear Model (GLM) Regression Technique for TCE in Sand

Input Parameters

Sample Location	Top Depth (feet below ground surface)	Bottom Depth (feet below ground surface)	Soil Result (ug/Kg)	Soil Result Qualifier	Leachate Result (ug/L)	Leachate Result Qualifier
KEB-11(18-20)-LT	18	20	190		3.8	
KEB-11(28-30)-LT	28	30	450		6.3	
KEB-11(38-40)-LT	38	40	300		6.6	
KEB-11(48-50)-LT	48	50	570		9.5	
KEB-11(56-58)-LT	56	58	340		7.3	
KEB-11(8-10)-LT	8	10	130		3	
KEB-15(28-30)-LT	28	30	330		6.8	
KEB-15(32-32.5)-LT	32	32.5	350		5.8	
KEB-15(38-40)-LT	38	40	400		5.7	J
KEB-15(48-50)-LT	48	50	450		4.9	
KEB-15(56-58)-LT	56	58	350		4.1	
KEB-4 (38-40)-LT	38	40	240		4.9	
KEB-4 (48-50)-LT	48	50	380		4.4	
KEB-4 (52-54)-LT	52	54	550		7	
KEB-4 (56-58)-LT	56	58	74		2	
KEB-4(28-30)-LT	28	30	110	J	1.3	J
KEB-4(36-38)-LT	36	38	200		2.9	
KEB-5 (48-50)-LT	48	50	830		11	
KEB-5 (52-54)-LT	52	54	320		7.1	
KEB-5 (56-58)-LT	56	58	720		4.4	
KEB-7 (32-34)-LT	32	34	220		2.8	
KEB-7 (38-40)-LT	38	40	130		4.2	
KEB-7 (46-48)-LT	46	48	580		4.2	
KEB-7(48-50)-LT	48	50	410		5.7	
KEB-7(56-58)-LT	56	58	340		5.2	
KWB-10(14-16)-LT	14	16	1,500		38	
KWB-10(25-27)-LT	25	27	280		5.5	
KWB-10(35-37)-LT	35	37	830		21	
KWB-10(40-42)-LT	40	42	130		2	
KWB-10(50-52)-LT	50	52	200		3.5	
KWB-12(20-22)-LT	20	22	280		4.7	
KWB-12(30-32)-LT	30	32	7,000	J	15	J
KWB-12(40-42)-LT	40	42	220		3.8	
KWB-12(52-54)-LT	52	54	320		5.4	
KWB-12(58-59)-LT	58	59	250		3.9	
KWB-13(18-20)-LT	18	20	110		1.3	
KWB-13(20-22)-LT	20	22	110		1.7	
KWB-13(38-40)-LT	38	40	180	J	4.8	
KWB-13(48-50)-LT	48	50	200		4.1	
KWB-13(50-52)-LT	50	52	250		5.1	
KWB-9(10-12)-LT	10	12	16	J	0.5	U
KWB-9(32-34)-LT	32	34	100		2.3	
KWB-9(44-46)-LT	44	46	120		1.9	
KWB-9(50-52)-LT	50	52	300		4.4	
KWB-9(58-60)-LT	58	60	110		1.3	
KWB-9(6-8)-LT	6	8	34		0.5	U

Notes:

U Less than the laboratory reporting limit for the analyte.

J Estimated value because compound meets the identification criteria but the result is less than the reporting limit and greater than the MDL or quality control criteria were not met.

Code and Output

```
> glm(Soil~Leachate,family=Gamma(link="identity"))

Call:  glm(formula = Soil ~ Leachate, family = Gamma(link = "identity"))

Coefficients:
(Intercept)     Leachate
    -15.12        78.02

Degrees of Freedom: 45 Total (i.e. Null);  44 Residual
Null Deviance:      53.94
Residual Deviance: 12.83        AIC: 591.5
> model <- glm(Soil~Leachate,family=Gamma(link="identity"))
> summary(model)

Call:
glm(formula = Soil ~ Leachate, family = Gamma(link = "identity"))

Deviance Residuals:
    Min       1Q   Median       3Q      Max
-0.7658  -0.3976  -0.1785   0.0226   2.5527

Coefficients:
            Estimate Std. Error t value Pr(>|t|)
(Intercept)   -15.12      16.53  -0.914    0.365
Leachate       78.02      11.66   6.689 3.27e-08 ***
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

(Dispersion parameter for Gamma family taken to be 0.7161787)

    Null deviance: 53.944  on 45  degrees of freedom
Residual deviance: 12.826  on 44  degrees of freedom
AIC: 591.54

Number of Fisher Scoring iterations: 6

> confint(model, level=0.9)
Waiting for profiling to be done...
                 5 %      95 %
(Intercept) -34.34772 25.12911
Leachate     60.72727 99.39911
Warning message:
glm.fit: algorithm did not converge
```

Soil (ug/kg) = 78.02 * Leachate (ug/L) - 15.12

Leachate = 5 ug/L
Soil = 60.72727 * 5 = 304 ug/kg (without intercept)